UNIVERSAL

MODEL AIRPLANE NEWS

NOVEMBER

20¢

THE ONLY MAGAZINE DEVOTED EXCLUSIVELY TO EXPERIMENTAL AVIATION"

U. S. NAVY CURTISS F11C-3

Enthusiastic Letters

PRAISE

Scientific's Sensational

NEW HI-FLYERS

each 50¢ POSTPAID

20" WING SPAN! GUARANTEED TO FLY!

Each New HI-FLYER Kit Contains: Finished drilled prop, finished drilled wheels, 2 sheets colored tissue, bottle banana oil, tube cement, washers, finished drilled nose plug, finished wire fittings. All ribs, bulkheads, fairings, printed on balsa. Rubber motor. All balsa strips cut to size. Full-size plans and explicit instructions.

Gentlemen:
To date we have ordered one Hi-Flyer kit from you and have been very much satisfied with the material that you sent us, as well as with the promptness with which you sent it.
W. J. White, Instructor
Board of Public Education
Macon, Ga.

Gentlemen:
I wish to say that the Hi-Flyer kit I received was as complete and fine as any I have bought during my six years of model building. Your company may be sure that I will patronize you in the future.
Tom R. Goldberg,
Great Neck, N. Y.

Gentlemen:
I received your Hi-Flyer kit of the Fairchild. A kit like yours sells for 4 times as much money in Germany. I would be glad indeed to sell your American Hi-Flyers kits here in Germany.
Ernest Schalk
Berlin, Germany

Gentlemen:
I am glad to say that I received my Hi-Flyer kit yesterday. I am very well pleased with the quality of the material, and appreciate your service.
Anthony DiChesera
Rochester, N. Y.

Gentlemen:
The Hi-Flyer I ordered from you about 2 weeks ago performs beautifully. I have advised all of my friends to buy Scientific Hi-Flyer kits.
George L. Garski
Minneapolis, Minn.

Gentlemen:
I built one of your Waco Model A Hi-Flyers a short time ago, and found it very satisfactory. Enclosed find four dollars for your complete assortment of new Hi-Flyer kits. Why don't you make larger order blanks?
Wm. Krames,
Bristol, Pa.

Gentlemen:
Your 50c Hi-Flyer kits are nothing new to me as I have been selling your 20 inch beauties to my customers and club members for quite some time. They are the best kits for the money on the market today.
William Aimers
Brooklyn, N. Y.

Gentlemen:
I received a Hi-Flyer kit for Xmas and in all my five years of model airplane building I have not seen a more complete kit for the price. I also wish to say that since I have been dealing with you my models have been neater and stronger.
Walter Laucher,
Linden, N. J.

Gentlemen:
I was extremely satisfied with the Hi-Flyer kit ordered from you a few weeks back. The material was of excellent quality so I am enclosing another order with this letter.
Nathan Marion, Jr.
Butler, N. J.

Gentlemen:
Who said that your Hi-Flyers wouldn't fly? Boy-um boy-O-boy! Sixty-two seconds, with a half prop. Takes off, climbs neat, flies SWELL.
Stanley Berger
Lafayette, Ind.


20" JAPANESE KAWASAKI FIGHTER 50c Postpaid


20" ARMY DOUGLAS YI0-43 50c Postpaid


20" BOEING PURSUIT F4B-4 50c postpaid


20" WACO Y.K.C. 50c Postpaid


20" FAIRCHILD CABIN 50c Postpaid


20" CURTISS CYCLONE HAWK 50c Postpaid


20" HOWARD "IKE" 50c Postpaid


20" FRENCH MUREAUX CI PURSUIT 50c Postpaid

Dear Sirs:
So pleased am I with the Hi-Flyer model kit that I ordered from you, that I am placing an order for four more of your wonderful Hi-Flyer kits. It is the best bargain for $.50 that I have ever seen.
Vincent Niznick
Pueblo, Colorado

Dear Sirs:
I received your Hi-Flyer Curtiss and never had a more interesting ship. I won second prize in the fair and should have had first. It is too pretty to fly.
Gordon Deneen, Jr.
Bedford, Va.

Gentlemen:
I have had many of your kits and find them very good flyers. And Oh, Boy! do they look like the real ships. One of the Hi-Flyer models holds the record in my school.
Charles Gardner,
W. Roxbury, Mass.

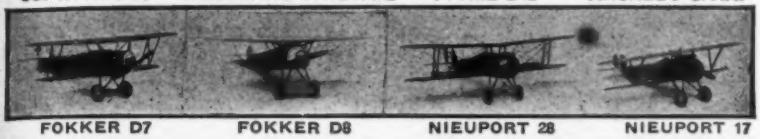
These testimonials are on file in our office

SCIENTIFIC MODEL AIRPLANE CO., 218-220 N11 Market St., Newark, N. J.

New and Improved 1/4 Inch Scale Kits

(Solid Wood)

SOPWITH PUP WESTLAND WAGTAIL PFALZ D12 ANSALDO S.V.A.

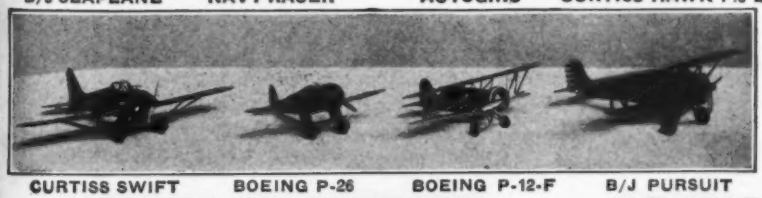


FOKKER D7 FOKKER D8 NIEUPORT 28 NIEUPORT 17

PFALZ DIII BRISTOL FIGHTER SPAD 13 HALBERSTADT

CAMEL FOKKER S. E. 5A ALBATROSS

B/J SEAPLANE NAVY RACER AUTOGIRO CURTISS HAWK P.6 E



CURTISS SWIFT BOEING P-26 BOEING P-12-F B/J PURSUIT

BUILD 4

Exact 1/4-Inch to the Foot SCALE MODELS

for $1.50

The planes pictured here can be had in kits at 50 Cents each, or Four for $1.50.

Each kit contains all wood parts CUT TO OUTLINE SHAPE; die cast machine guns, where needed; die cast propellers and wheels. Metal seats all made, paints, glue, insignia, real scale plans etc.

Die cast radial motors are included in modern plane kits where needed.

In addition to the planes pictured here you can get kits for the Hawk P. 5, Curtiss Racer, Hawker Fury, Supermarine, D.H.4, D.H.5, Vought 65, and Monocoupe 90, at the same price.

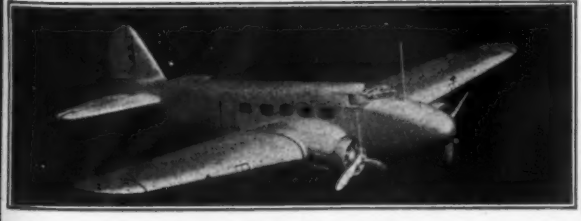
REMEMBER

We are the originators of the 1/4-inch-to-the-foot scale model airplanes with the following features:

- **All parts are cut out**
- **Die cast propellers**
- **Die cast wheels**
- **Die cast machine guns**
- **Finished metal seats**
- **Full-size 1/4 Scale Drawing in These De Luxe Kits**

Note: This price does not apply to the Boeing Transport or Bomber

BOEING TRANSPORT



BOEING BOMBER Y1B-9A

Now you can build the Boeing Transport or the Boeing Bomber pictured here and have an exact 1/4 inch scale replica model for $1.65

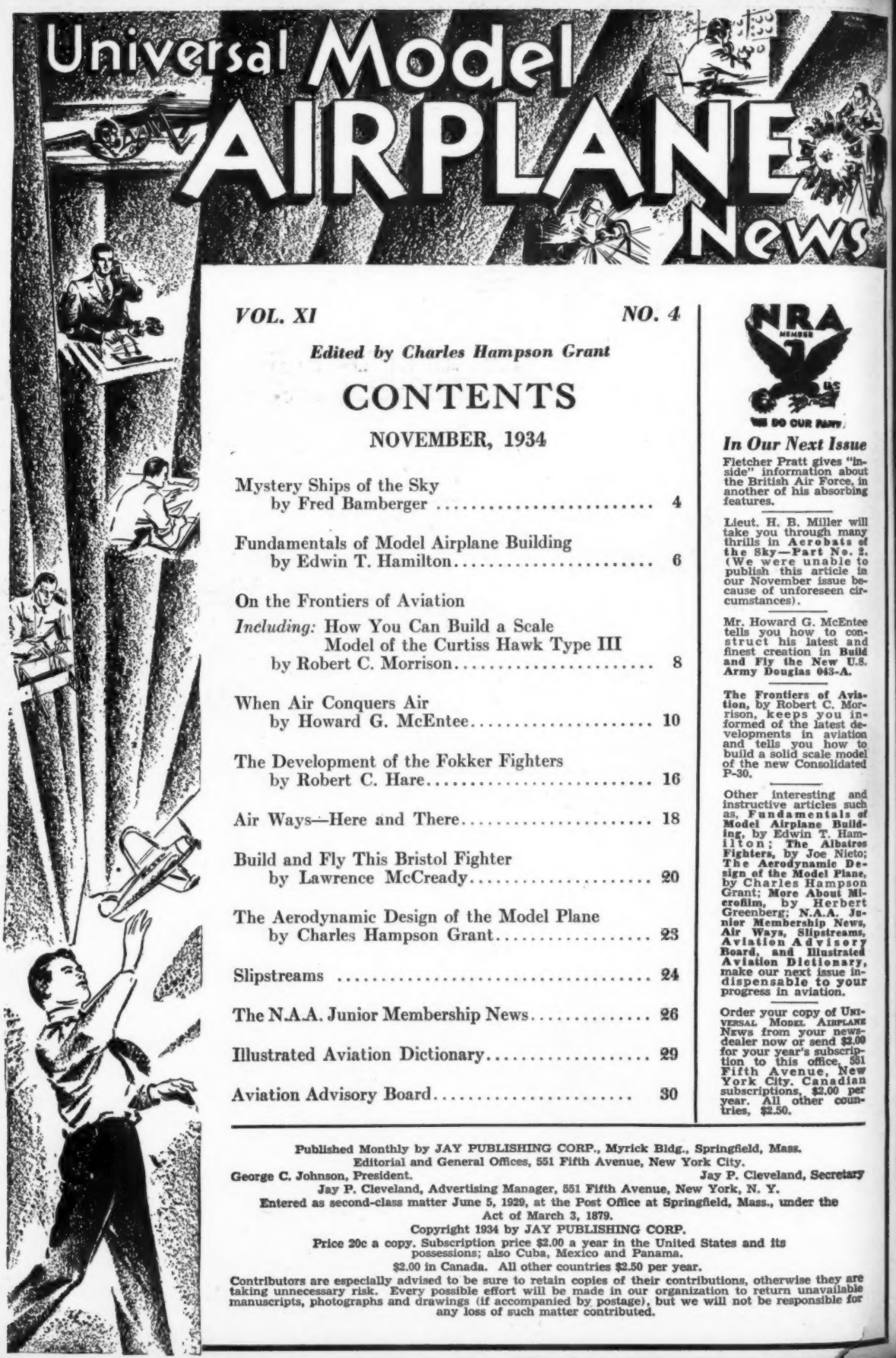
The kit sets contain all the wood parts cut to outline shape, two scale die cast Wasp Motors, two scale die cast three bladed propellers, all ready to mount, and cast wheels. A full size 18 1/2 inch wing span plan, glue, paint, etc., comprise the kits. When you consider that the fuselage, wings, rudder, and elevator are cut to shape and NOT blocks of wood, motors and propellers are ready to mount, and the size of the plane, 18 1/2 inch wing span, you will realize we have produced a construction set that is in a class by itself. We Guarantee these kits to be as stated, and know you will be satisfied.

These kits can be had in either balsa or pine at $1.65 EACH

HAWK MODEL AEROPLANES

4946-48 Irving Park Blvd. Dept. W5. CHICAGO, ILL.

NOTE:—Please add 10% to your order for postage.



VOL. XI *NO. 4*

Edited by Charles Hampson Grant

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NOVEMBER, 1934

In Our Next Issue

Fletcher Pratt gives "inside" information about the British Air Force, in another of his absorbing features.

Lieut. H. B. Miller will take you through many thrills in **Acrobats of the Sky—Part No. 2.** (We were unable to publish this article in our November issue because of unforeseen circumstances).

Mr. Howard G. McEntee tells you how to construct his latest and finest creation in **Build and Fly the New U.S. Army Douglas 043-A.**

The Frontiers of Aviation, by Robert C. Morrison, keeps you informed of the latest developments in aviation and tells you how to build a solid scale model of the new Consolidated P-30.

Other interesting and instructive articles such as, **Fundamentals of Model Airplane Building,** by Edwin T. Hamilton; **The Albatros Fighters,** by Joe Nieto; **The Aerodynamic Design of the Model Plane,** by Charles Hampson Grant; **More About Microfilm,** by Herbert Greenberg; **N.A.A. Junior Membership News, Air Ways, Slipstreams, Aviation Advisory Board, and Illustrated Aviation Dictionary,** make our next issue indispensable to your progress in aviation.

Order your copy of UNIVERSAL MODEL AIRPLANE NEWS from your newsdealer now or send $2.00 for your year's subscription to this office, 551 Fifth Avenue, New York City. Canadian subscriptions, $2.00 per year. All other countries, $2.50.

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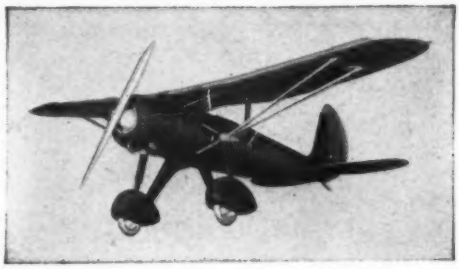
$2.00 in Canada. All other countries $2.50 per year.

MODEL BUILDERS, ENTER THIS 2ND "NATIONAL" MODEL BUILDING CONTEST

A New National ½" Scale Model

Fairchild 22, Model C7-F

A 2 Place Open Sport Plane



Wingspan 16½", Overall lgth. 12½", Wgt. ¾ oz. Colors: Green Fuselage, Orange Wing & Tail, Silver Trim. This ½" true scale model is another faithful reproduction which includes many exclusive National features and methods for simplified construction. Features are hollow motor tube, turned cowl, windshields and instrument boards, elevators and rudder adjustable.

Kit contains full size ½" scale plan fully detailed for construction of either exhibition scale or flying model with enlarged tail surfaces and flying prop. All wood parts are Grade A Balsa either semi-finished or printed out making them easy to shape. Formed wire parts, cement, clear dope, aluminum and Jap tissue in colors for covering. Its single wing and light weight assures every model builder of a thrill to build and fly. Complete Kit (Plus P. P. 15c) **$1.00**

Other National $1 planes include Army Boeing, P-12-E, Navy F-4B-3, Curtiss Condor Bomber, British Super-Marine, and the Curtiss A-8 Attack.

Beechcraft A-17-F

A new 4-passenger high speed ship.

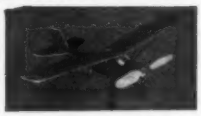
A true ¾" "NATIONAL" scale model. Wing span 25⅝", length 18", wgt. 2½ oz. Colors red and black, silver trimmed. Faithful in every detail including wing and tail controls, deep cowl, navigation and landing lights. The above illustration is an exact photo of the model itself. This new "National" kit contains many simplified construction features, as ready turned cowling and wheels, stations and ribs, and numerous other parts neatly printed on clear white balsa, making them easy for you to cut out. The safety motor tube is another feature. Kits contain ample cement, clear and colored dope. Japanese tissue, formed wire parts, props and insignia. Also full size plan with fully detailed instruction. This is a ship every model builder will enjoy building and can exhibit or fly with pride ..... (plus P. P. 25c) **$2.50**

18 FAMOUS MODELS

National offers 18 12" flying scale models: Lockheed Vega (Winnie Mae), Hawk P-6-E (Illus.), Boeing P-12, Curtiss Falcon, Curtiss Helldiver, British Hawker Fury, Polish P-6, Sikorsky Amphibian, Bellanca Airbus, Texaco 13, Gee Bee Sportster 1931, Lockheed Sirius, Laird 400, Albatross, Pfalz, Nieuport Scout, Fokker Triplane, Akron Fighter. Each kit complete ..... (plus P. P. 10c) each **50c**

4 FAMOUS WAR-TIME MODELS

Including the Sopwith Camel, (Illus.). S.P.A.D., Capt. Rickenbacker's famous war-time fighting ship, British S.E.5 and the Fokker D-7. These four famous war-time ships are 12" flying scale models. Each kit complete... (plus P. P. 10c) each **35c**



TAYLOR CUB

A 12" flying scale model of the well known cabin monoplane. Other 25c kits in this group include Fokker D-8, Bellanca Liberty, Heath Parasol, Taylor Cub (Illus.), Puss Moth, Curtiss Robin. Each kit complete including blue print and instructions. Now (plus P. P. 10c) each **25c**

26 GRAND PRIZES INCLUDING $75.00 in CASH PRIZES

and

HUNDREDS OF LOCAL PRIZES

Anyone can enter this contest and every plane entered gets a prize. No limitations. No restrictions. Two classifications—Junior Class for Models 15" and under; Senior Class for Models 16" and over. Enter either or both classes. Enter as many planes as you like. Contest starts Sept. 15 and closes March 16, 1935. Get busy—enroll today.

SEND 3 CENTS to cover mailing for the latest catalogue and bulletins of "NATIONAL" fleet of over 50 planes including some of the very latest ships, supplies, and full details and rules of this contest. Write today.

COL. LINDBERGH'S LOCKHEED SIRIUS SEAPLANE

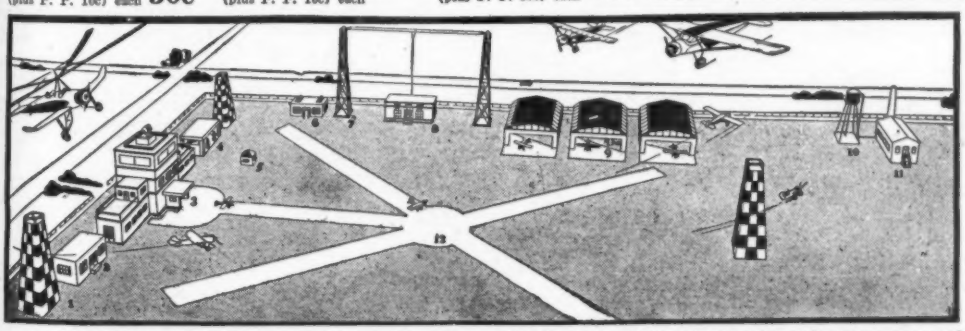
The flying Colonel took his "Tingmissortog" over 30,000 miles of Arctic waste. That was FLYING news. National's authentically detailed ½" flying scale model of this famous ship is MODEL news; Kit contains many exclusive National features for easier construction and better results. Ready turned cowl, all stations printed and numbered to plan. Colors, black and orange, silver pontoons, wing span 21½", length 15½", wgt. 2 oz. Complete kit ..... (plus P. P. 15c) **$2.00**

SPECIAL BLUE PRINTS

3 PRINTS FOR 25c PREPAID

Here's a real bargain. These fully detailed blue prints with all instructions for building any of the 12" flying scale models here listed—3 for 25c, while the supply lasts. **Send your order today. Don't delay.**

Sopwith Camel	Bellanca Airbus	Sikorsky Amphibian
Boeing P-12	Gee Bee 1931	Akron Fighter
Lockheed Vega	Curtiss Helldiver	Fokker Triplane
Hawk P-6-E	Laird 400	Curtiss Falcon



NATIONAL'S NEW MINIATURE AIRPORT

Feel yourself right in the atmosphere of one of the great airports of the country as you build and arrange this colorful miniature model. The complete kit features 10 buildings, 3 pylons, radio tower, a ground plan 44" x 62" with its soft green background, runways, aprons and location of buildings worked out. Kit also includes a fleet of 12 tiny replica planes that take their place about the field or in the hanger. Here's a real construction project for individual, school, or club. Kit complete with plans and full instructions—all you need is sharp knife and paint brush.

AIRPORT KIT CONSISTS OF

1. Three Pylons	$.35
2. Post Office	.25
3. Administration Bldg.	1.00
4. Gas Station, 5. Refreshment Stand	.50
6. Machine Shop	.50
7. Radio Towers, 8. Radio Station	.50
9. Three hangars	.75
10. Water Tower, 11. Power House	.50
12. Field Mat	.50
13. Six Commercial Model Kits	.35
14. Six Sport Model Kits.	.35

Airport construction kit, complete, as shown and listed above (plus P. P. 35c) **$5.00**

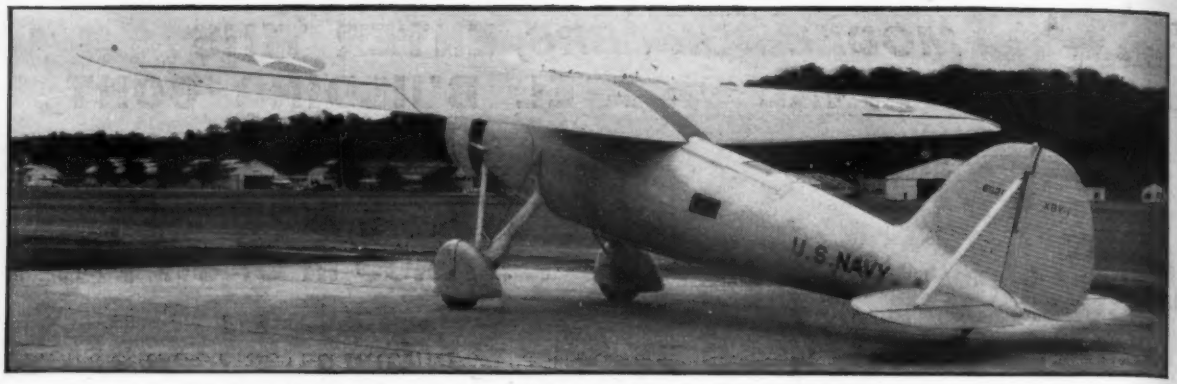
DEALERS and AGENTS—Write for Special Offer

This 2nd Big National MODEL BUILDING CONTEST offers you a real opportunity to cash in on the NATIONAL LINE. Write today for full details of our Special Contest Offer.

NATIONAL MODEL AIRCRAFT & SUPPLY CO.

23 Ave. "E," Bluebird Bldg., Dept. A-53, New Rochelle, New York

Canadian Distributor: St. John Bros. & Twomey
644 Portage Ave., Winnipeg, Man., Canada.
Canadian prices 40% higher to cover duty.



The Consolidated Observation bomber XBY-1. This is a fast sturdy ship of metal construction

Mystery Ships of the Sky

The Inside Story of the Latest Experimental Planes Submitted for Testing to the U. S. Navy

By FRED BAMBERGER

IN THE course of experimental work and design, every year a number of new type airplanes are built by aircraft manufacturers and submitted to the testing division or as most people call it, the Flight Test Section of the U. S. Navy. These airplanes are built in accordance with specifications issued by the Bureau of Aeronautics, U. S. Navy, and should they pass the strict service tests, they may then be accepted into actual service by the U. S. Navy.

A number of these airplanes fail in the tests, they crash or prove their unworthiness in some manner. When this occurs, the airplane may be rebuilt and thus it becomes lost to the average aviation enthusiast. It is very interesting and makes very absorbing reading to discuss the characteristics of these ships, as well as the planes which in all probability will be accepted. First, however, one must have a general idea of how the Navy tests its experimental airplanes.

A plane you may have never seen, the Sikorsky Amphibian fighter

All photographs printed through the courtesy of the U. S. Navy

The U. S. Navy has three main bases, where airplanes of experimental nature are tested. These three bases are the Naval Air Station Anacostia, N. A. S. Hampton Roads, and the N. P. G. (Naval Proving Grounds) Dahlgren. The greatest amount of the test work however is carried on at Naval Air Station Anacostia, just across the Potomac River from Washton, D. C.

Here all type of test work is carried on. Weighing of all planes, empty and fully loaded, Altitude tests for ceiling determining, speed tests with and against the wind and getting the true data.

The speed tests are carried on at a very low altitude usually fifty to one hundred feet from the ground. This is to prevent losing time while getting altitude. Airplanes are also tested with guns, bombing, radio communication, torpedo releasing and other tactical usages. Different types of propellers are tried until the one with the highest degree of efficiency is found. All airplanes are also carefully photographed from a number of different standard positions. Close ups of new and interesting detail work on struts, gun mountings, cowlings, retractable landing gears, bomb racks and various other sections are taken. The Photography Section at N. A. S. Anacostia is a very highly specialized division and to go through its files of experimental airplane photographs, is an intensely interesting experience. Here one may see the aircraft designs of earlier years which were tested but not accepted. One can see the improvements over the earlier airplanes in service, the files are a complete pictorial history of United States Naval Aviation.

After the airplanes are tested at Anacostia, they are flown over to the Naval Proving Grounds at Dahlgren, Va., which is only a few miles from Anacostia. Here the aircraft are stunted and put through all sorts of aerial tricks and maneuvers. Here the vital "terminal velocity" or as it is more familiarly known "dive bombing" tests are carried on. The test pilots try their best to literally "tear the plane apart in mid-air." They stunt them in all positions, dive them for absolute speed and see if they come out of these dives safely and in a reasonable amount of time. These "terminal velocity" or dive bombing tests are the most vicious tests of all, for the pilot never

One of the fastest Navy fighters, the Grumman FF-1

The Martin torpedo plane which is an important factor in present day naval fighting

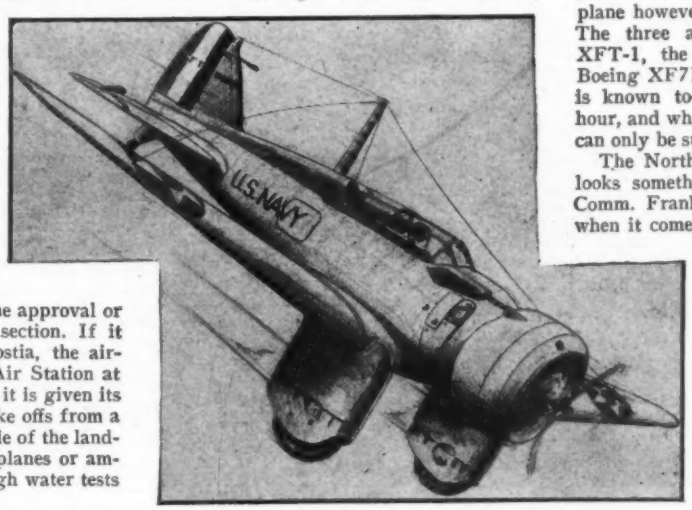
knows just how the airplane will stand up.

The test pilot flies with a pad strapped to one of his legs, and he makes notations as to the behavior of the new plane. To a casual observer on the ground watching these tests, one might think that the pilot was up there having a "grand time." This is far from the truth, however, for it is the hardest and most dangerous kind of flying, but each dive and turn is a vital and important part of protecting the lives of pilots who may fly a similar type of plane later on.

From the N. P. G. Dahlgren, the airplane usually goes back to Anacostia where experimenting is carried on for another period of time until it has the approval or disapproval of the testing section. If it passes the section at Anacostia, the airplane is then taken to the Air Station at Hampton Roads, Va., where it is given its carrier deck landings and take offs from a "deck" constructed at one side of the landing field. In the case of seaplanes or amphibians, they are given rough water tests to see if they can "take it."

If the airplane successfully passes the requirements as set by the Navy, then it will in all probability be accepted for service. However the tests may take over a year. From this general idea of how the Navy tests its new types, it can be seen that planes must be faultless in order to be accepted. Here is a fact that is not generally known. The U. S. Government purchased a foreign type of fighting plane which was well known to all the other nations. They put this airplane through the U. S. Naval tests. In the vertical dive bombing tests, it collapsed and crashed, killing Lieut. George Cuddihy of the Flight Test Section. This incident shows conclusively the comparative stamina of the aircraft of the United States and other countries, but it cost the Navy a valuable man to gain this conclusive evidence. It is men like Cuddihy and the rest of his fellow officers and men in the flight test section of both the U. S. Army and Navy, who are the real heroes of American Aviation to-day, yet they do not receive the praise and credit they so richly deserve.

One hears a great deal about the high speeds of military aircraft of foreign countries. It is a persistent rumor however, that Great Britain credits her military airplane speeds without a full military load. Whether this rumor is true or not, we do not know, but when one sees figures published concerning U. S. Navy or Army airplanes, they are actually with full and necessary military equipment.



The new Northrop pursuit plane, by Ralph Pickard

The United States has in experimental stages today, air craft which are equal, if not better than those of foreign countries. The difference between the U. S. and foreign countries is that when they get a fighter or bomber that goes quite fast, they advertise the fact, while the U. S. just keeps on trying but rarely tells the general public just how fast the U. S. Army or Navy airplanes really are. This attitude sometimes causes the public to become unduly alarmed, although their fears are groundless. If the public would delve into the records of new airplanes in the Army and Navy now going into service, they would feel greater respect for American airplane designers.

At present the U. S. Navy is testing three different new type fighters, each plane however, is of the monoplane type. The three airplanes are the Northrop XFT-1, the Curtiss XF13C-1, and the Boeing XF7B-1. Each of these airplanes is known to cruise over 200 miles an hour, and what their actual top speeds are, can only be surmised.

The Northrop is a low-wing ship and looks something like a baby brother to Comm. Frank Hawks' "Sky Chief," but when it comes to traveling, it stays right with Hawks' ship and then possibly it may leave the old "Sky Chief" in its slipstream.

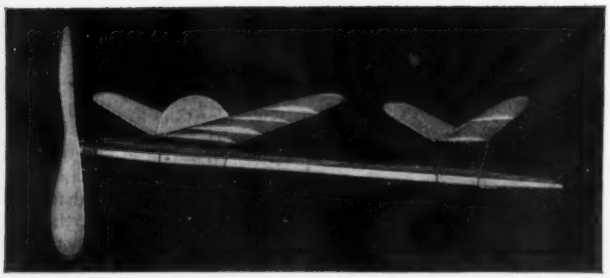
The Curtiss XF13C-1 is a high-wing fighter, but the interesting part of this airplane is that it is a closed type of fighting plane with retractable landing gear. The pilot is seated in a cabin. I overheard one of the pilots say after he had climbed out of the plane: "This is one of the finest airplanes I've ever flown and the guns are easy to handle without a windstream in your face." The Navy men at the test station claim that the Curtiss Fighter is a shade faster than the Northrop although the latter is a little easier to maneuver.

The Boeing job was sent to the station at Anacostia but due to some faults which it had, it was sent back to the Boeing Plant to be remodeled. It is known as the Boeing XF7B-1 and is a low-wing fighter somewhat on the order of the Army "P-26A" model, the difference being retractable landing gear, a covered cockpit, and cleaner design. However, with these new and speedy types of fighters, the Navy is coming along in very fast order and is on a par with the other countries.

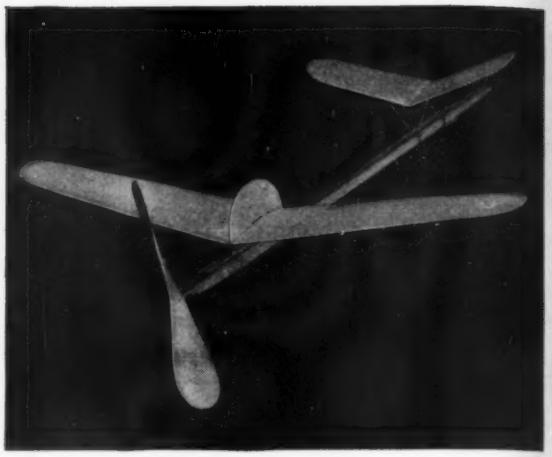
The Great Lakes dive bomber XBG-1 gives fine performances

The Bureau of Aero-

(Continued on page 36)



Here is the completed model, more stable than any single propeller pushers you have ever flown



The high front wing improves its lateral stability. Note the left hand propeller, turning opposite from tractor propeller

Fundamentals of Model Airplane Building

A Complete Course for Beginners Who Wish to Become Expert. How to Build Your First Single Propeller Pusher. — Part 7

By EDWIN T. HAMILTON

IN THE seventh model to be presented in this series, Mr. Grant brings to the reader the first single propeller pusher. It has proved to be a remarkable performer for an all-balsa plane. The difference between a "pusher" and "tractor" plane lies in the position of the propeller. If the propeller is in front of the main supporting surface, it is called a tractor because the propeller tends to pull the plane. If the propeller should be located behind the main supporting surface, the plane is called a pusher because the propeller tends to "push" the plane.

As the propeller of this model is behind the wing or "main supporting surface," it is a pusher. It is likewise known as a "single propeller pusher" because it has only one propeller which is located behind the wing. Next month, we will give a "twin propeller pusher," which is so-called because it has two or "twin" propellers, both located behind the main wing. These models are often spoken of as "single-stick pushers" or "twin-stick pushers."

The chief problem of a single propeller pusher has been one of stability. This is because the twist of the motor stick and the torque of the propeller both act to make the model turn to one side. This fault has been overcome by raising the elevator well above the motor stick and giving it considerable dihedral. It will be found to fly in a stable circular path.

Its climbing ability has proved remarkable. Under ordinary conditions, flights of two minutes or more can be easily obtained over a distance of from 1000 to 1500 feet. With six strands of ⅛″ rubber, the motor may be wound 475 to 500 turns by hand. If lubricated and wound by a winder, this can be increased to 900 or 1000 turns.

With a winding of 900 turns by the latter method, the model has a pitch distance of 1500 feet. Pitch distance equals the number of turns stored in the motor multiplied by the pitch of the propeller, which in this case is 16″. This estimate of distance will prove a conservative one.

The model is simple to build; will glide well at a steady, flat angle, and will turn in performances equal to the best of contest models. Under ordinary conditions, it will reach an altitude of 200 feet and make a splendid appearance in the air.

Here's your chance to build and fly an all-balsa, single-propeller pusher second to none! Let's get busy, build this clever plane and know the thrill of flying the best.

The building instructions for this model will not be as detailed as most of the preceding ones because its lines so closely follow those of the endurance model given last month. It might be well to turn to your October issue (Page 9), and again read the instructions given there. You will find both building operations considerably the same for that plane and the one given here. However, there are several points quite different, which will be fully explained here.

Motor Stick

The motor stick is a single piece of balsa measuring ¼″ thick, ⅜″ wide or deep, and 26″ long. The top of the stick is left perfectly flat, as shown in the plans under "Side View," while the bottom has both ends tapered. At the front, this taper is started 3¾″ back. It tapers from the original depth of the stick to 3/16″ at the front. (Note that the "front" of the motor stick of this model is exactly opposite from the front of all the other models given so far, as this is a pusher plane and therefore has its propeller at the trailing or back end of the stick).

At the rear end of the stick, the taper starts back 3″ and is beveled from the original depth of ⅜″ to 3/16″ at the end. At this same end on its upper side, the usual propeller bearing is cemented and silk bound to the stick, as shown in the plans.

A nose hook is bent from No. 13 piano wire to the form shown in the plans under "Nose Hook." This is shown full size. It is then cemented around the front end of the stick, as shown in the "Side View." On the underside of the motor stick, 3¾″ back from its front end, a small 1/16″ x ¼″ x 2″ long block is cemented in place. This offers less elevation for the leading edge of the elevator should this prove necessary. The front clips of the elevator are fitted over this block, which in turn pulls the leading edge lower.

Elevator

Make the elevator in two duplicate halves. Cut these to shape from two 1/32″ thick, 2⅞″ wide and 6¼″ sheet balsa, as shown in the plans under "Elevator." The grain of the wood should run parallel to the center line of each half wing. Turn to the ribs in the plan, which are shown full

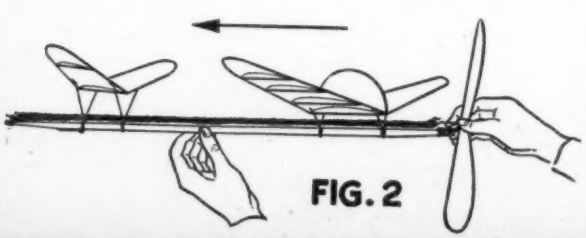


FIG. 2

FIG. 1

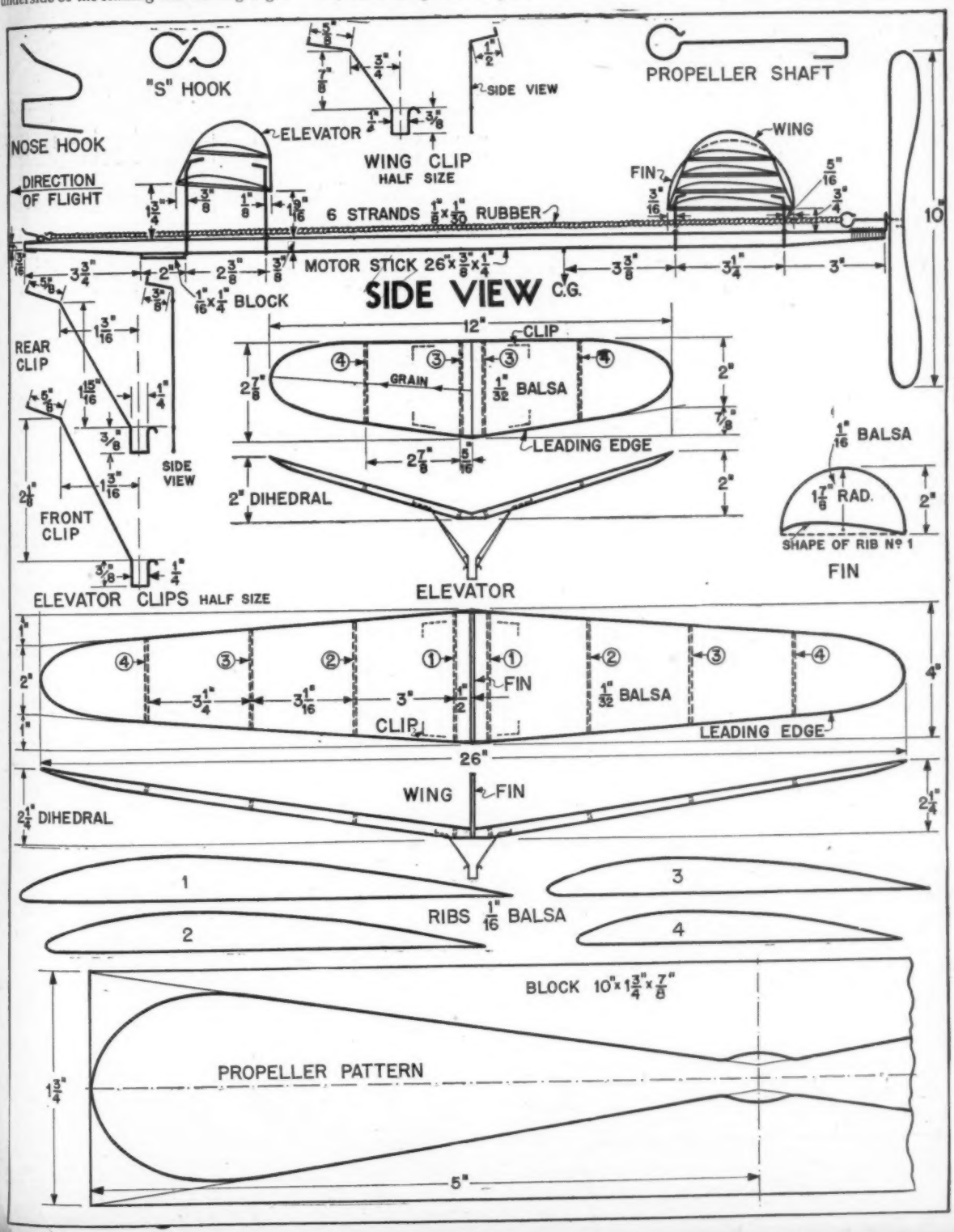
size. These are of 1/16" balsa. Four are required for the elevator; two No. 4 and two No. 3.

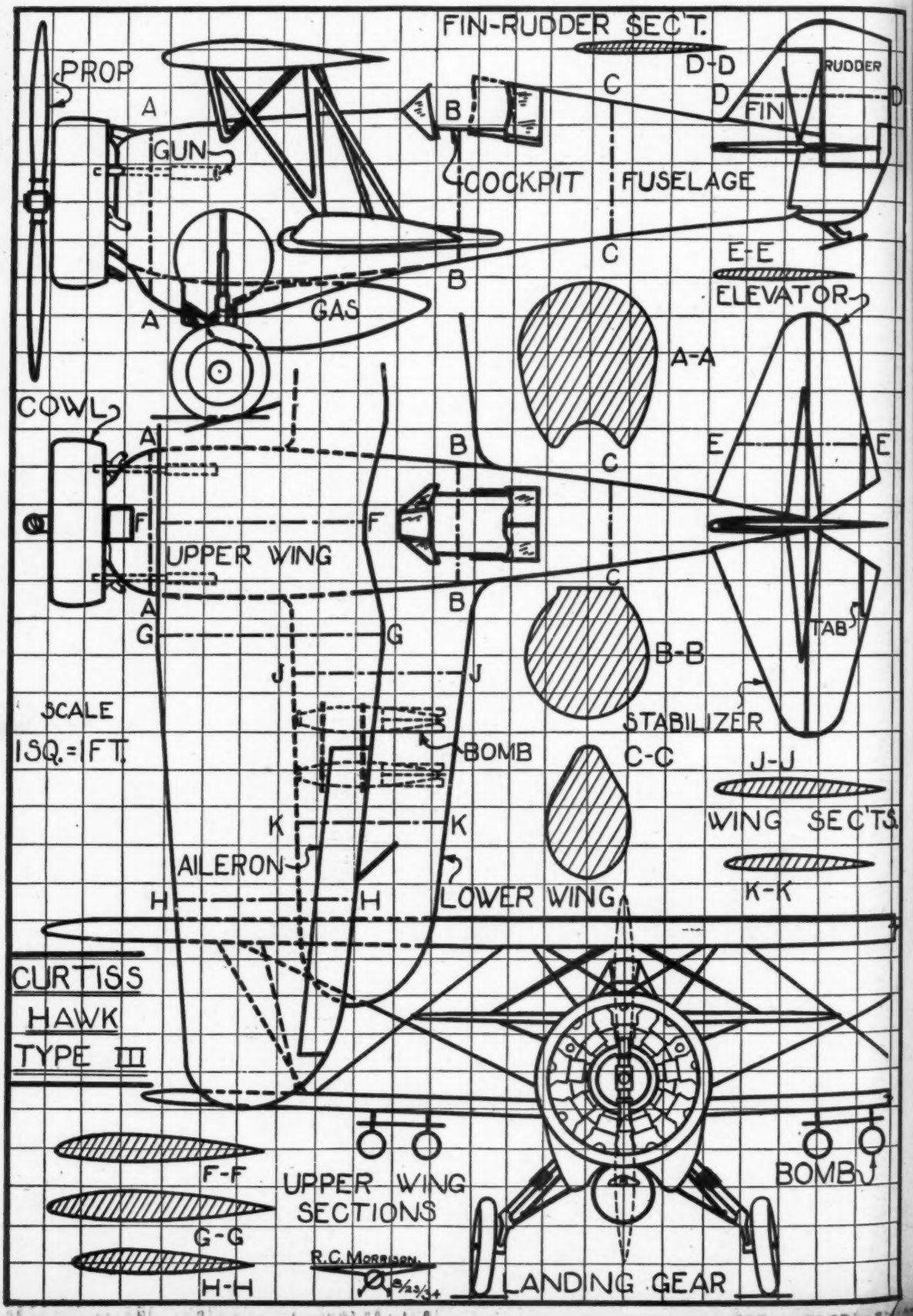
Cement the ribs in place, as shown in the plans and hold the sheet balsa to them with model pins until dry. Join the halves together with a 2" dihedral. Flatten the underside of the leading and trailing edges between ribs No. 3, as shown in the edge view. Two pieces of No. 6 piano wire form each of the two necessary elevator clips. Note these in the plans under "Elevator Clips." These are bent and attached exactly the same as the wing clips of last month's model. Cement them in place on the elevator, which completes this part.

Wing

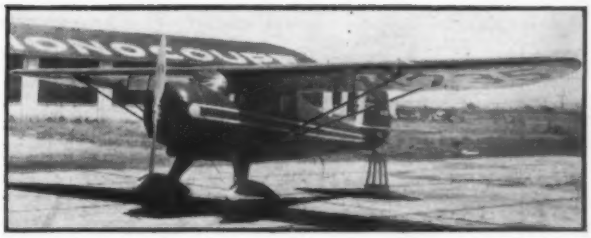
The wing, like the elevator, is made in two duplicate halves. Its basic construction is the same as the elevator. Each half is cut from sheet balsa measuring 1/32" thick, 4" wide and 13¼" long. Note that both the leading and trailing edges are

(Continued on page 32)




FIN-RUDDER SEC'T.
D-D
RUDDER
FIN
PROP
GUN
COCKPIT
FUSELAGE
E-E
ELEVATOR
GAS
A-A
COWL
UPPER WING
TAB
B-B
SCALE
1SQ.=1FT.
BOMB
STABILIZER
C-C
J-J
WING SEC'TS.
K-K
AILERON
LOWER WING
CURTISS
HAWK
TYPE III
F-F
G-G
H-H
UPPER WING
SECTIONS
R.C. MORRISON
LANDING GEAR
BOMB

The Curtiss Wright Amphibian. Speed 151 m.p.h.



The latest Monocoupe. Note the cowl of new design

On the Frontiers of Aviation

Recent Developments in British and American Airplanes—How You Can Build a Scale Model of the Curtiss Hawk Type III

By ROBERT C. MORRISON

THE European countries, especially England, are busily at work on new airplane designs which they hope will compare favorably in performance with our outstanding aircraft. The most favored English planes among Americans have unquestionably been the De Havillands.

The De Havilland Aircraft Co., Ltd., has always been a predominating figure in the English commercial plane manufacturers' field, but now they have a very serious competitor, a steadily growing company that was only founded three years ago. It is no other than Airspeed, Ltd., of Portsmouth, England. Their present success may probably be contributed to their new Airspeed Envoy.

This twin-engined low-wing ship has a retractable landing gear which, as on many of our planes, retracts into the motor nacelles. The plane is exceedingly clean in design. Its eight passengers are enclosed in a spacious cabin with large windows, offering splendid visibility. The Envoy's performance is as follows:

Engines—Two Wolseleys-185 h.p. each
Max. speed—170 m.p.h at sea level
Cruising speed—150 m.p.h.
Landing speed—55 m.p.h.
Initial climb—914 ft. per min.

Judging from its performance, one can well understand that it compares favorably with our low powered sport planes. Incidentally we do not have any twin-engined sport plane of note and it is about time we had. Such a plane as the Envoy powered with the new Warner Super-Scarabs, would be a fine sport plane for this country and would undoubtedly be very popular.

The present 185 h.p. Wolseleys that power the plane are of new design and are said to be very dependable, but the nacelle, cowl and prop spinners mar the appearance of the plane. If they could be built more compact than at present, employing a full N.A.C.A. cowl for example in place of the ring cowl and a two-bladed Hamilton controllable pitch prop in place of the present four-bladed one, hte design

The Luscomb Phantom. Top speed 168 m.p.h. The oval streamline fuselage and new type of cowl give it grace and high performance

The compact new Lambert R-266 engine of 90 h.p.

of the ship could not be any closer to perfect. On the whole it is one of the best foreign planes I have ever seen, and Messrs. Norway, Wallis and Tiltman, Airspeed engineers, deserve a great amount of credit. They are now building a specially designed Airspeed Envoy with many modifications for the MacRobertson Race.

America's hopes of winning that noted race are slowly dimming. Nearly all of the twenty-two Americans who filled out entry blanks have found the venture too expensive and have given up the idea of competing. There will probably only be about half a dozen Americans in the race. Even if an American does not win, there are good chances that a foreign pilot flying an American plane will.

Clyde Pangborn has been out to the Pacific coast negotiating for a new plane for the race. He has decided not to fly a Gee Bee as previously announced.

A special Northrop is said to be being built for the MacRobertson race. Another new racing plane is Ben Howard's cabin plane that can do about 300 m.p.h. The fourth Brown racer has been produced since the Pan American Air Races this year at New Orleans, where the first made its debut.

Mr. W. K. Vanderbilt's new Douglas Dolphin is to be used on a trip over Europe and Africa. The plane is equipped with extra gas tanks to increase its range. There will be ample room in the cabin of the twin-engined amphibian for eight passengers and a large supply of provisions. A two-way radio set has been installed. The ship has a cruising speed of 135 m.p.h., and is very similar in design to former Douglas Dolphins.

Twenty-three Consolidated flying patrol boats are now under construction and they will have great improvements over the complement of twenty-three recently produced for our Navy. They will be much faster, about 145 m.p.h. high speed, and will have a longer cruising range than their predecessors. The cost to the government is $90,000 each. The entire fleet will be completed by Spring.

About thirty T. W. A. Douglases have been completed to date.

More information has "leaked" out on the new Curtiss Hawk Type III. The plane has been built especially for high altitude fighting and bombing. Its construction is quite similar to that of former Hawks with the exception of the landing gear, which is rectractable. The wheels retract into the "belly" of the fuselage and are flush with its sides, thus offering a minimum amount of resistance.

Floats may also be connected to the pursuit ship. An additional fin is connected to the underside of the rear of fuselage when this is done.

(Continued on page 42)

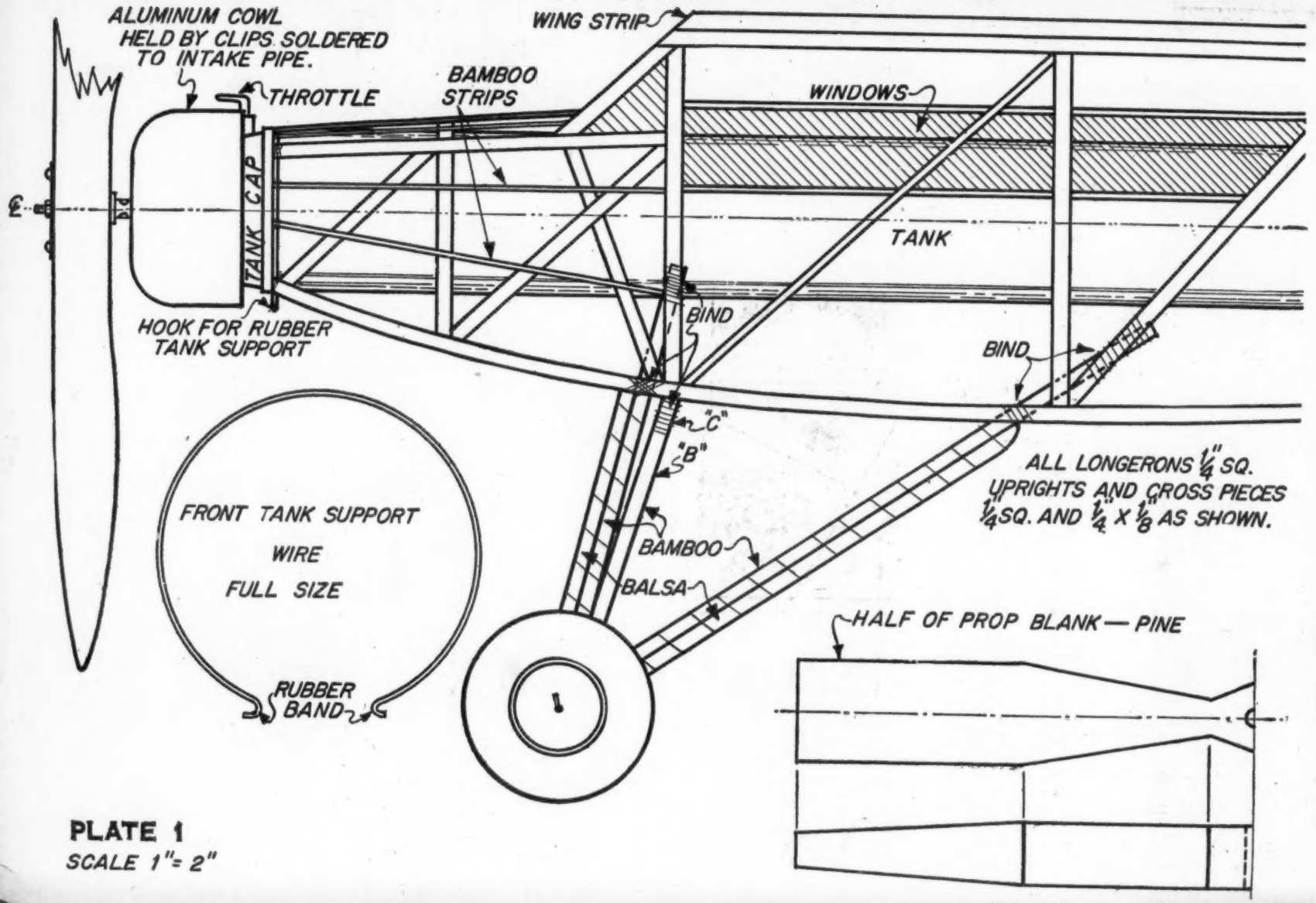


PLATE 1
SCALE 1"= 2"

The McEntee compressed air model "takes off"

The finished model is graceful, light and strong

When Air Conquers Air

An Expert Builder Tells You How to Construct and Fly a Successful Five Foot Compressed Air Model

By HOWARD G. McENTEE

THE building and flying of a compressed air model is an aeronautics course in itself, more so than rubber-driven models, because we are dealing with an actual power plant, one which must be "run in," lubricated, cleaned and repaired just as a real power plant is. Thus, we have the logical step between rubber-driven models and those powered by miniature gas engines. The gas-driven and compressed air models are similar in that there is a real weight to be carried and the model cannot be built on a featherweight plan, not if you value your power plant.

The technique of flying is also somewhat similar in that the models must be handled and launched with much more care than is often exercised with the rubber models. The latter can often crash into trees, houses or even the ground and suffer no damage, due of course, to the very light type of construction that is employed. The powered model on the other hand, has a definite weight to carry, and a crash, even a minor one, means some repair work. Therefore, the flyer learns to use caution with his model and not to fly it in any place or weather.

As mentioned before, the compressed air model should be viewed as the intermediate step between rubber-driven models and those driven by miniature gas engines. Consequently, the serious builder of rubber type ships should try an air model before trusting himself to handle the much more expensive gas type.

A great wave of interest in powered models is now sweeping the country. This has been directed to a large extent toward gas engine models. However, the writer believes that when the many ambitious builders who cannot afford the $15.00 or more for a reliable gas engine, realize the similarity between air and gas-powered models, they will seize on the former as a means of experimentation, at least until they have gained the knowledge and the necessary cash needed for the gas power plant.

A compressed air power plant is a rather simple mechanism. It consists of three main items, tank, motor and propeller. For those who are not quite familiar with the construction, a brief description will be given.

The tank is usually made of brass or bronze foil for lightness. The seamless type of tank is the most reliable, although a tank made by wrapping the thin sheet around a mandrel and soldering the joint is quite satisfactory. The ends are of thin material, hemispherical in shape and are soldered on. The tank is then wrapped with thin steel wire spaced an eighth of an inch apart, each turn being soldered to the tank in one or two places to keep it in place.

The only fittings needed are a throttle valve and a filling valve, the latter threaded to fit the hose end of a tire pump. These fittings are now easily procurable and are especially made for the purpose, being very light in weight and reasonably priced. In a pinch, a bicycle tire valve may be used and the throttle valve can be taken from a discarded model steam engine, although they are rather heavy.

The tanks are surprisingly strong for their weight, some of the ready-made tanks being guaranteed for over 200 pounds pressure. A safety valve can be installed but they are rarely used, since unlike a steam boiler, the pressure is determined by what you pump into the tank and it cannot increase. The tanks are more or less standardized as to size, being 2½", 3" or 3½" in diameter and 24, 30 or 36 inches long in most cases.

There should be some care used in the selection of the pump if possible, as one with a long barrel that is small in diameter is much the easiest with which to attain the needed high pressure. A large barrel pumps quicker, but the job is much harder when the pressure increases. Most of us, however, borrow the most convenient car or bicycle pump we can and struggle along with it. A tire gauge of the dial type is an extremely handy item to have. Some of these gauges read as high as 150 pounds or more, the type used for truck tires. Those made for balloon tire use and reading to about 45 pounds are not of much value.

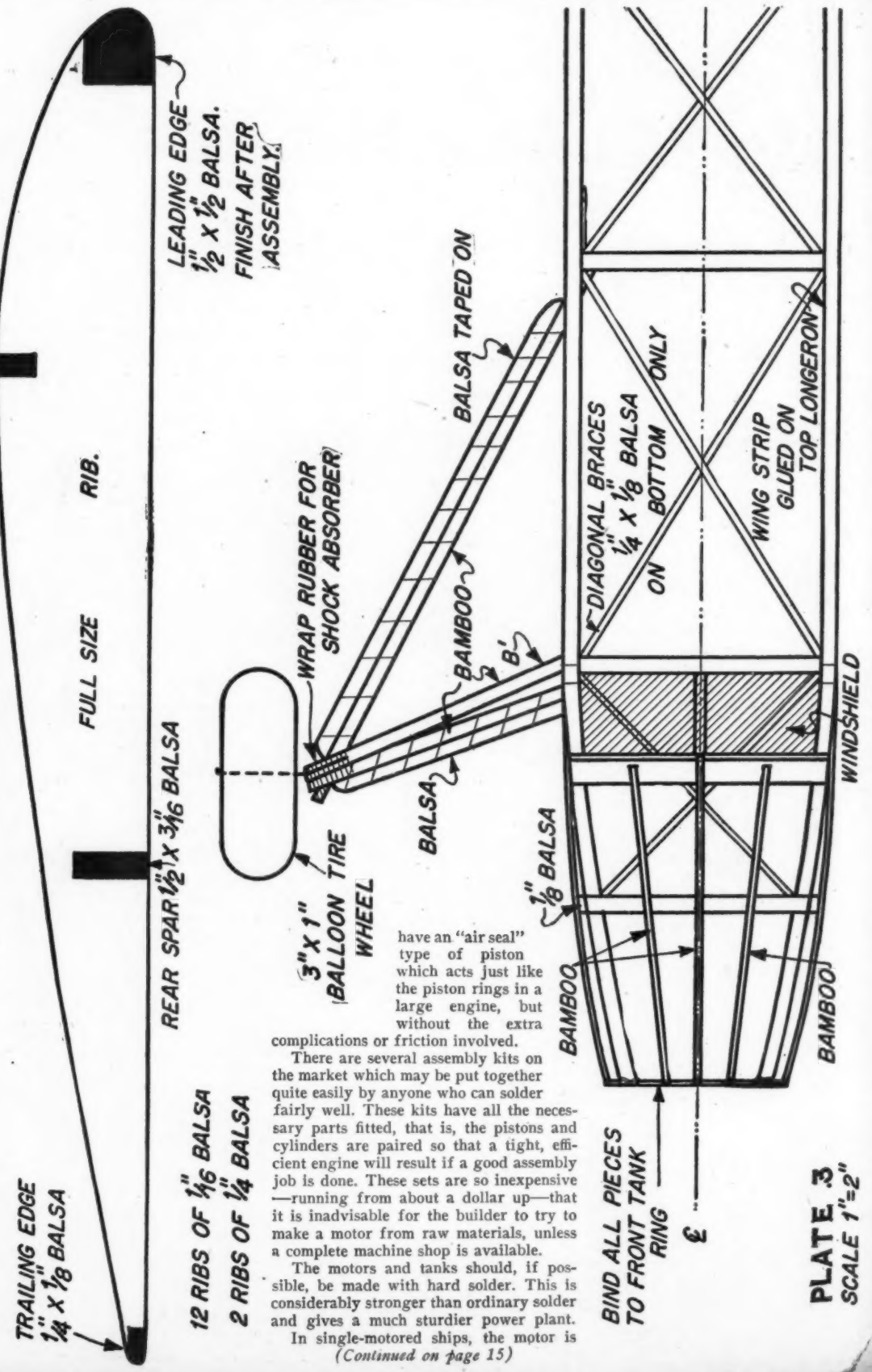
The next item we come to is the motor. Here we find a far larger variety than is the case with the tank. The number of cylinders varies from two to six and sometimes more. The bore and stroke vary too widely to give any limits. The motors themselves vary from the simple two-cylinder skeleton type to those beautiful multi-cylinder jobs with closed crankcases, regular valves and, unfortunately, many ounces of weight. The most popular is the three-cylinder motor with an open type frame. These have a fairly smooth power flow and they do not need to be spun by hand to start as do the "two's," and they are light. A good engine of this type is about three inches in outside diameter, will spin a 14" propeller and propel a six or more foot model. And, most important, the weight is less than an ounce.

These little engines have regular pistons, connecting rods and counter-balanced crankshafts. They use a sort of sleeve valve scheme in which the crankshaft serves efficiently as both intake and exhaust valve for all cylinders. Some of them

Mr. McEntee and the model ready to hop

MATERIAL

¼" sq.—8 3-foot lengths
¼" x ⅛"—10 3-foot lengths
⅛" sq.—4 3-foot lengths
3/16" x ½"—3 3-foot lengths
½" sq.—3 3-foot lengths
⅛" x 2"—1 3-foot length
¼" x 1½"—1 3-foot length
1/16" x 3"—2 3-foot lengths
8 1-foot lengths ¼" x ⅛" bamboo
Pine block—15" x 1" x 1 9/16"
2—3" x 1" Wood wheels
14" x 4" Thin celluloid
⅜" Linen tape
1—1" Wood wheel
1 foot 1/16" O. D. tubing
4 feet No. 16 Music wire
3 feet No. 8 Music wire
8 feet ⅛" flat rubber
1 foot ¼" O. D. alum. tubing
1 foot ¼" Dowel (birch)
Brass strip 2" x ¼"
Aluminum cowl 3" dia. x 1½"
Tank—24" x 2½"
3 Cylinder motor to fit
20 Sq. feet model silk
Dope, glue, thread, etc.



have an "air seal" type of piston which acts just like the piston rings in a large engine, but without the extra complications or friction involved.

There are several assembly kits on the market which may be put together quite easily by anyone who can solder fairly well. These kits have all the necessary parts fitted, that is, the pistons and cylinders are paired so that a tight, efficient engine will result if a good assembly job is done. These sets are so inexpensive—running from about a dollar up—that it is inadvisable for the builder to try to make a motor from raw materials, unless a complete machine shop is available.

The motors and tanks should, if possible, be made with hard solder. This is considerably stronger than ordinary solder and gives a much sturdier power plant.

In single-motored ships, the motor is

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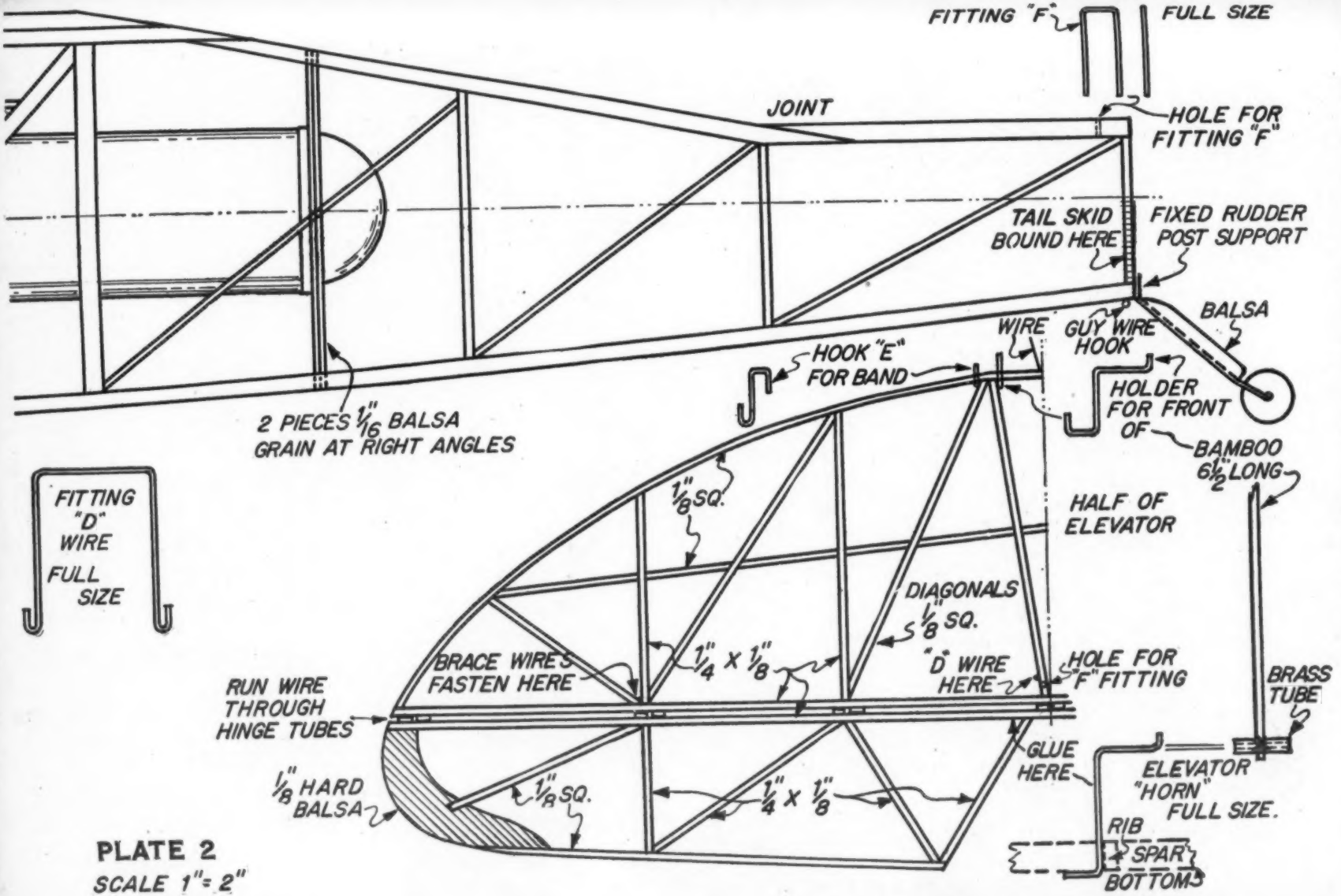


PLATE 2

SCALE 1" = 2"

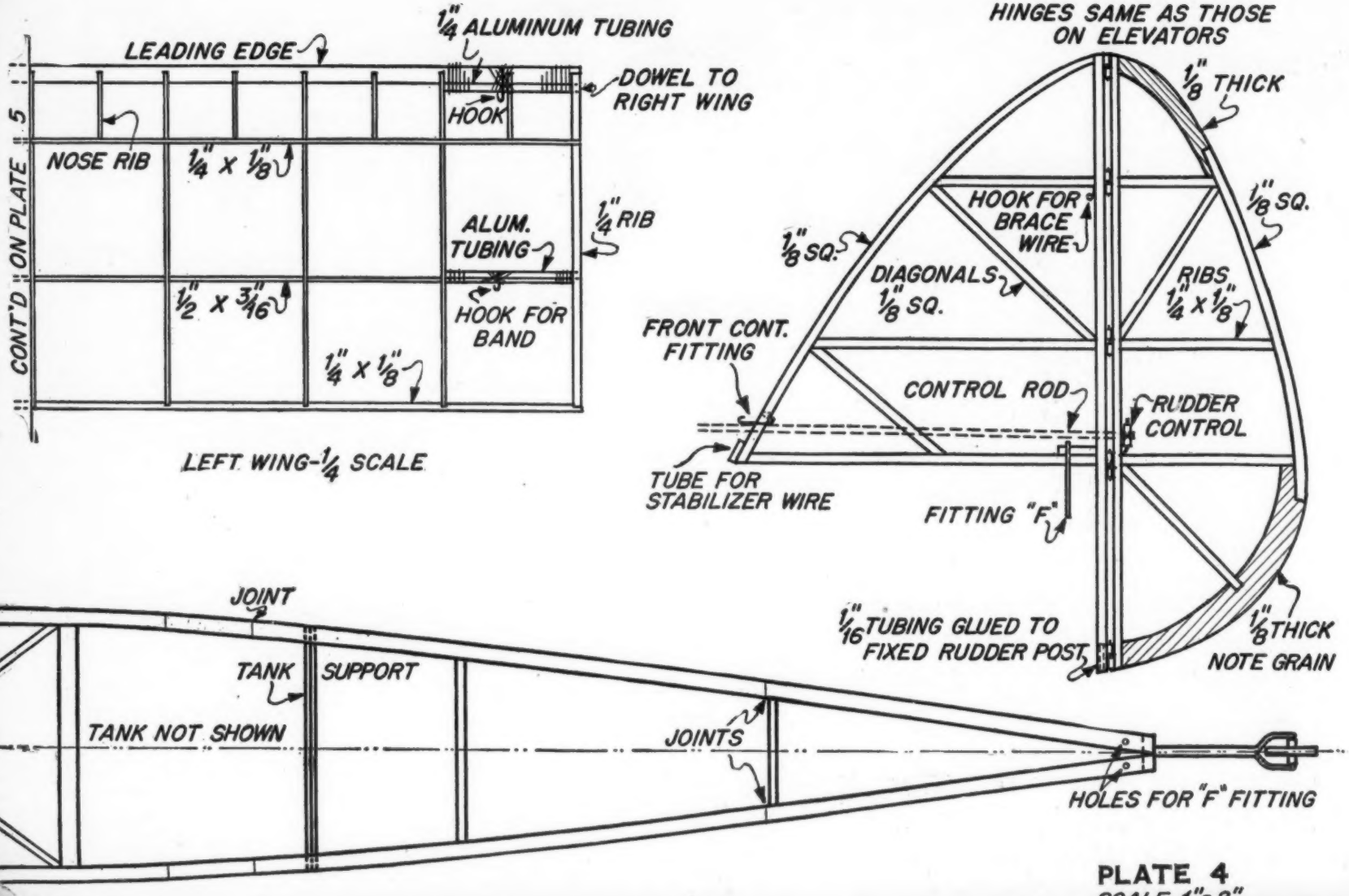
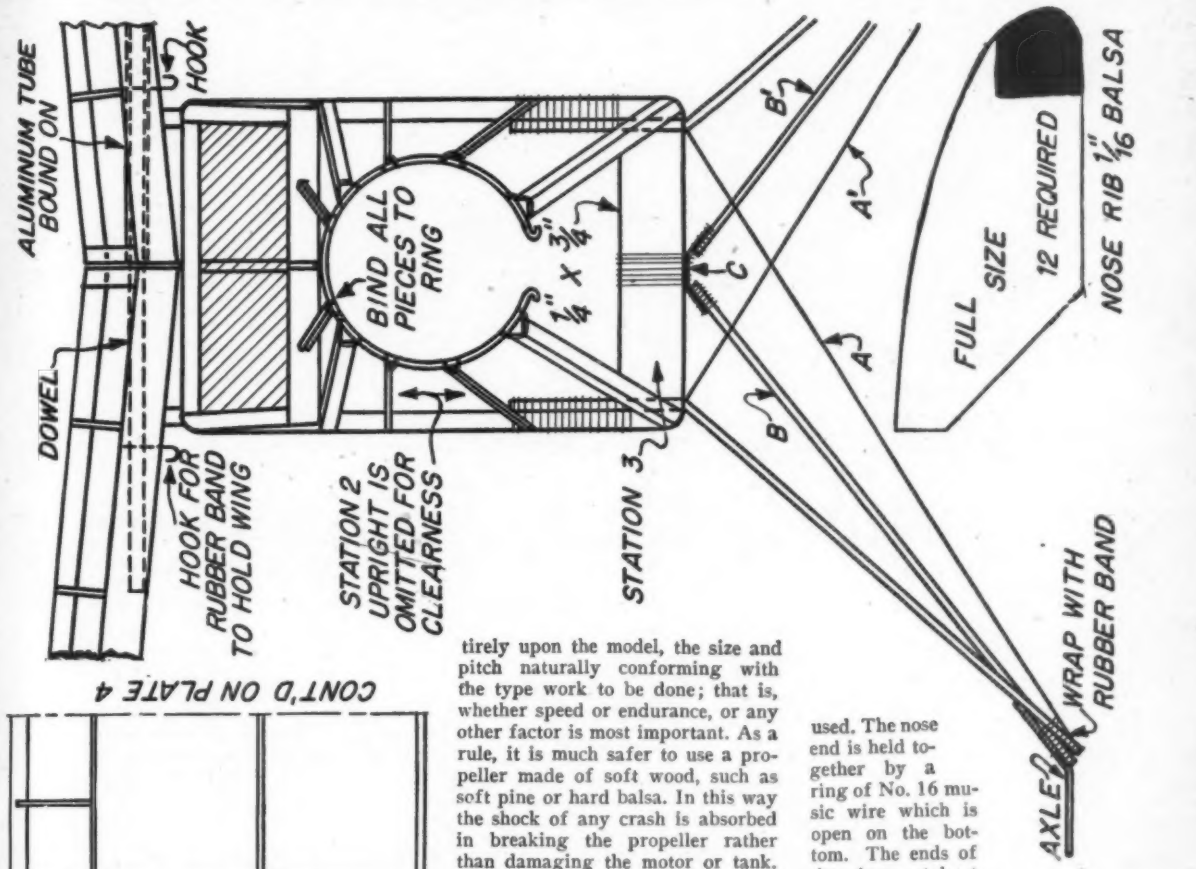


PLATE 4
SCALE 1"=2"



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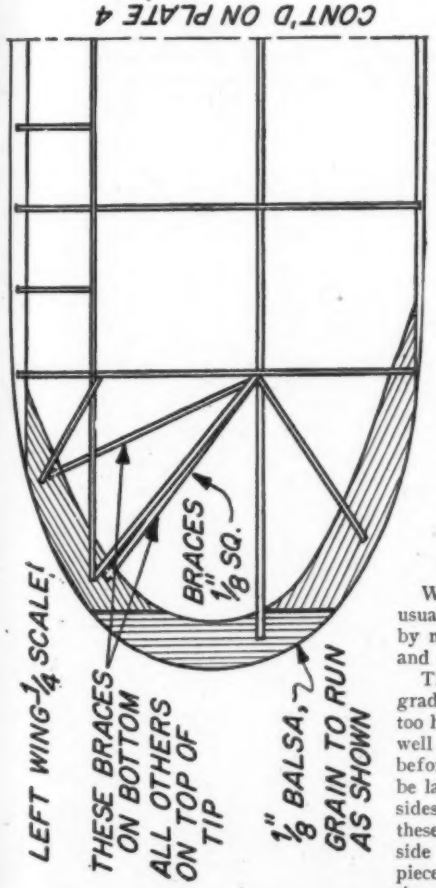

often soldered directly to the front of the tank with short brass strips. This makes the whole power plant into a compact, easily handled unit.

The propeller of course, depends entirely upon the model, the size and pitch naturally conforming with the type work to be done; that is, whether speed or endurance, or any other factor is most important. As a rule, it is much safer to use a propeller made of soft wood, such as soft pine or hard balsa. In this way the shock of any crash is absorbed in breaking the propeller rather than damaging the motor or tank. This is a valuable safety measure as a bent crankshaft will just about ruin the usefulness of any engine. For this reason, it is advisable before trying any test flights, to make several propellers, so that operations need not be suspended if one is broken.

After the above rather general description, we are now ready to go ahead with the actual construction of the model itself. This model is of no particular type. Rather, it is designed for a specific purpose, to carry a compressed air power plant. It is not an endurance model although very good flights can be made with it.

We shall start with the fuselage as usual. This is made in the customary style, by making the two complete side frames and then joining them at top and bottom.

The fuselage is made of a medium grade of balsa which should be neither too hard nor too soft. All joints should be well glued and allowed to dry thoroughly before being disturbed. The plan should be laid out on a long flat board and both sides built over the same drawing. When these are absolutely dry, lay them bottom side up on a board and glue in the cross pieces between stations 3 and 5. This section of the fuselage has no curve. Next, line up the rear end of the frame and insert all the cross pieces from the cabin back to the tail post. There is no rudder post fastened to the rear end, so a piece of 1/8" x 1/4" balsa of the proper length is used. The nose end is held together by a ring of No. 16 music wire which is open on the bottom. The ends of the ring are bent back to form hooks over which a rubber band is wrapped to hold the tank in place in the completed model. The ring should be measured on the tank to get the correct size before it is put in place. It is held by binding with thread and gluing to the forward ends of the longerons.

At station No. 5 is placed the rear support of the tank. This consists of two sheets of 1/16" balsa glued together, with the grain at right angles. In the center a hole is carefully cut, into which the rear of the tank is pushed. The hole should not be large enough for the tank to slide completely through. Most tank caps have a shoulder which is soldered over the body of the tank. This shoulder should come up against the tank holder, but not slide through, thus holding the tank firmly. This type of mounting allows the tank to revolve, so the ring has to be pulled tight enough with the rubber band to prevent this.

It may be found that some of the nose braces must be cut out a bit to allow the tank free access into the fuselage. In such cases, cut as little out as possible.

After the tank has been fitted, the nose streamlining of balsa and bamboo strips can be put in place. The bamboo strips are all secured to the outside of the wire ring with thread.

The window frames and windows themselves are now put in. Cellophane may be used, but thin celluloid is more substantial

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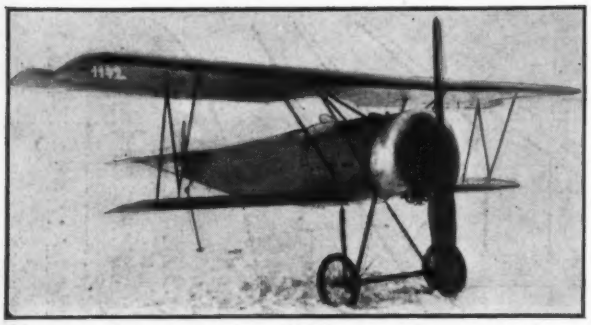


Fig. No. 3. The V.13. High altitude fighter version of the V.9

Fig. No. 1. The V19 developed from the Triplane. Dr. 1

The Development of the Fokker Fighters

Little Known Details of Fokker Planes Developed From the Famous Triplane, Which Were Forerunners of the D-7 Type

By ROBERT C. HARE

Part No. 11

Explanatory Note: Readers will remember that in Part Ten of this series, the Fokker Triplane was discussed; its conception in the summer of 1916, and final acceptance a year later. The present Part Eleven of the series takes up the sequence of the Fokker machines following the *conception* of the first triplane. The machines described here now are those which were built and tested while the Fokker Triplane was waiting for its official acceptance, nearly a year later.

OFFICIAL dickering over the merits and faults of the Fokker Triplane gave Fokker plenty of time to let his imagination and foresight run into new designs, all of which were so advanced that even the most practical minds of Germany became skeptical about their utility.

Fokker decided to construct cantilever wings exclusively for two main reasons. First of all, a cantilever wing as constructed by Fokker, was invulnerable under the hottest fire by virtue of its large sectional area. Second, the cantilever system did away with all external fittings and wires. This greatly aided in the setting up of a machine. There were no wires to adjust and consequently there was no necessity for alignment.

At the same time the large spars were far stronger than necessary and the large cambered wings thus possible did not give more speed, but provided excellent climb and maneuverability for which the Fokkers were noted. Instead of a running fight, a Fokker pilot could dive away from his adversary without fear of his wings coming off. This is why German pilots preferred the Fokker machines to the Albatros.

While official tests were being made at the Engineering Department, Berlin, Aldershop, to determine the airworthiness of the Fokker Dr. 1, not to mention the psychological effect the wireless triplane would have on pilots who flew the wire-braced and wing-breaking Albatros D. III, Anthony Fokker constructed a new machine which was known at Schwerin as the V. 9.

Figure 1 shows clearly the speedy, rakish lines of the new machine. With the triplane design fresh in his mind, Fokker styled the V. 9 after the three-decker and let his eye wander to the Nieuport 17 design, Figure 4, for additional inspiration.

Closely following the lines of the Dr. I, the fuselage was built up of steel tubing longerons with uprights of the same material. A sheet aluminum cowling covered the 110 h. p. Oberursel rotary motor which was attached to its engine bearer plate on the front of the body frame.

Immediately behind the engine and fire wall, the gasoline tank rested on felt-lined saddles above the thrust line. Sixty liters of petrol and 15 liters of oil provided fuel for about two hours' flight. On the turtle-deck in front of the pilot, a gasoline gauge was connected to the tank.

The landing gear of the V. 9 was conventional; the front landing struts attached to the motor bearing plate and the rear struts fastened to a fitting just forward of the lower wing spar recess in the fuselage. An auxiliary airfoil, metal framed and plywood covered, concealed the axle. Shock was taken up by rubber cords. Two bracing wires prevented any side-sway on landing or taking off in a wind.

The biplane cellule was of the wireless type, supported by steel tubing struts. In the upper plane, 26 ribs were employed with two main spars. The center portion above the cockpit was cut out to the rear spar to aid the pilot's upward vision. Ailerons, in the upper wing only, were attached to the reenforced trailing edge along their length and in plain view were merely projections which increased the chord. This method of aileron attachment greatly simplified wing construction. Three hinges and one control horn actuated this member.

Ten ribs in each lower wing panel mounted on two box spars constituted the structure of the lower wing. This plane was made in one piece and attached to the body by fitting the spars in two recesses provided for the purpose in the bottom of the fuselage. With fittings joined, a plate was then put over the underside of the body covering the spars and protecting the fittings from the wind.

Center section struts were made in the form of two pyramids of steel tubing, as can be seen in the illustration. The forward trio of struts consisted of a heavy master strut which was welded to the engine bearing plate. The two minor struts of this group were attached to the upper longeron. The rear trio consisted of identical members except that the master strut was attached to the lower long-

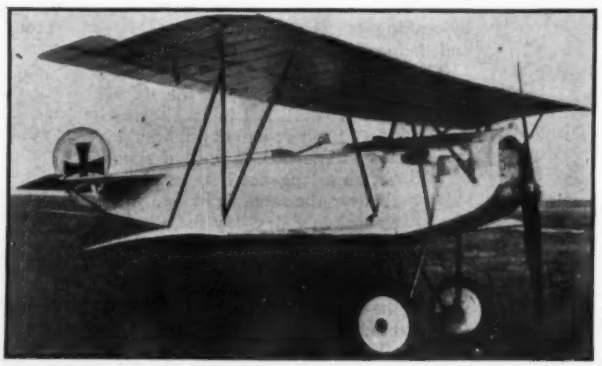


Fig. No. 2. The Fokker V.11., the forerunner of the famous D.7. It was a water cooled version of the V.9

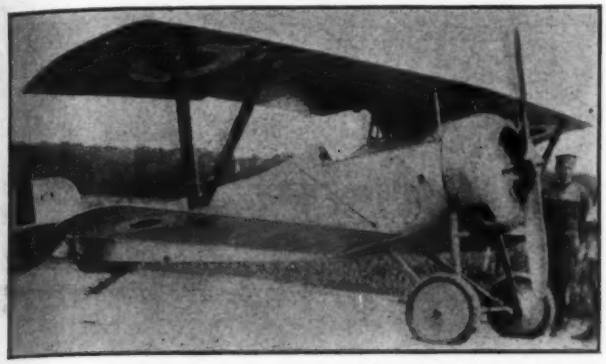


Fig. No. 4. The French Nieuport 17 provided inspiration for the V.9

Fig. No. 5. Fokker ready to test one of his early ships

eron. The two minor struts were fitted to the top longeron. The upper ends of the struts joined German ball-and-socket joints attached to the upper wing spars.

Interplane struts were obviously Nieuport copies since the rear strut was perpendicular and the front member inclined forward at about 30°. At the point of their attachment in the upper plane, a compression rib of heavy construction aided to prevent flutter in flight. The lower plane carried strut fittings in the wing spar through which ran a similar reenforced rib.

A tail assembly exactly like that of the Fokker Dr. I was employed in the V. 9 and need not be dealt with again. Fabric covered the entire plan except where noted elsewhere.

Performance figures for the V. 9 were not available, but since its general design was carried over into four distinct Fokker models, it can be assumed therefore that it had some merit as a fighter and needed small alterations to make it an acceptable design.

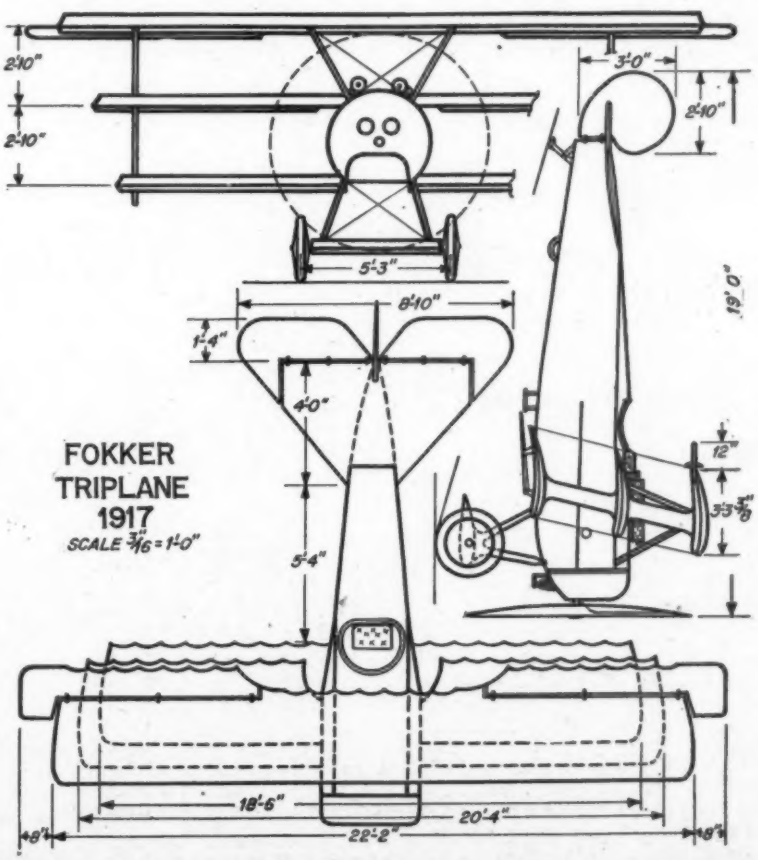
In Figure 2 you see the real granddaddy of the Fokker D.VII which appeared on the Front over a year later. This is the Fokker V.11, a modified and water-cooled version of the V.9.

Clean design, elimination of parasitic resistance and general ruggedness are features in the make-up of the V.11. The fuselage frame of the V.11 was made up of steel tubing cross-braced with steel wire. Mounted in front was a Mercedes six motor entirely cowled in by aluminum stampings. The cleanliness of the fore part of the V.11 is noteworthy in this respect. Even the curved exhaust pipe is enclosed except for the bell-shaped tube leading the gases out of the manifold at the rear of the motor.

The fire wall, immediately behind the motor, is followed by the petrol tanks arranged in the same manner as on the V. 9 but of larger capacity to take care of the hungry motor. The cockpit is let into the fuselage in the middle of the body where the pilot has an excellent view of the earth while in flight, yet without a serious blind spot. The plywood fabric-covered turtle-deck in front of the pilot is continued to the sternpost, effecting a smooth flow of air onto the tail plane and elevators.

In the landing gear several changes were made. Most important of these was the elimination of the auxiliary wing covering the axle. Heretofore the spars of this small plane served as anchorage points for fittings to which the lower ends of the landing gear struts were attached. However, the absence of the fairing made it possible to make each "V" of the landing gear one complete unit and attach the axle directly to the landing gear by means of shock absorbing cord. Forward struts were fastened to the lower longeron at a double joint fitting shared by one of the center section struts. The rear landing struts terminated at a point on the lower longeron just forward of the lower wing recess in the fuselage.

The tail assembly was identical to those used on the Dr. I and the V. 9. The horizontal stabilizer was bolted to and rested on top of the upper longerons. Balanced elevators were used. A balanced comma rudder served to provide directional control.



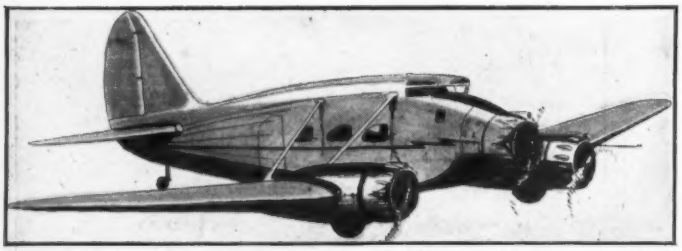
Designing a strong and efficient biplane wing assembly was of utmost importance to obtain the performance and ruggedness Fokker hoped for in the V.11. Two box spars in the upper wing carried along their span 30 full ribs made of spruce with top and bottom flanges of selected beechwood. The leading edge was made of plywood supported by a spruce auxiliary spar over which it was formed. A false trailing edge of steel wire gave the wing a scalloped effect, but was reenforced by the true trailing edge about four inches inward from the wire edge.

Two balanced ailerons were hinged to

(Cont. on page 34)

AIR WAYS
HERE AND THERE

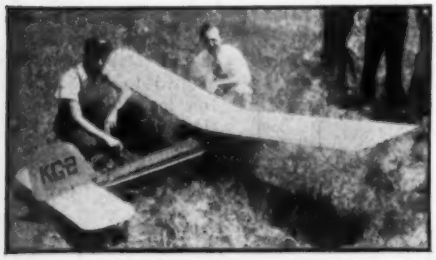
What Readers Are Doing to Increase Their Knowledge of Aviation in All Parts of the World. Send Pictures and Details of Your Experiments



The new Stinson A transport by Harland C. Wood

Pict. No. 2. A Macchi by H. Schubring

Pict. No. 3. A Boeing 95, by Dick Shipway



Pict. No. 4. Joe Kovel beside his 10 foot gas job that flew 23 minutes on 1⅛ ounces of gas

Pict. No. 6. Forum of expert builders

Pict. No. 7. Ben Hammer with his model Keystone O1-9. Said to be perfect in detail

Pict. No. 1. A model display of great variety, by Frank McQuown

Pict. No. 5. "Gas jobs" of the Bamberger Aero Club at the "Nationals"

SO MANY new ideas about model airplanes are born each month, it would seem that eventually there would be nothing new to talk about. However, it appears that for every new idea that we publish, two new ones "sprout up" the next month to take its place.

Unquestionably, model builders are becoming more versatile as time passes. This is well illustrated by the collection of models built by Frank McQuown of 826½ Chestnut Street, Bowling Green, Ky. Picture No. 1 shows a group of his ships which is of wide variation in size, type and construction. At the extreme lower left is a solid scale model of the Supermarine Speed Ship. It is beautifully made, as indicated from the photograph which we received. Around it appear several scale models of wartime planes. In contrast with these is the Curtiss Hawk P-6 E, one of the latest fighting ships.

The uncovered framework of this ship indicates some fine workmanship. Above it is a Travelair Mystery Ship. McQuown says it flies three hundred feet. The Lockheed Vega on the right is an exceptionally fine piece of work. McQuown, in this ship, has passed the real test of a good model builder; namely, the ability to cover his model faultlessly. Many details are included in this ship, as you will note. Careful examination will show miniature steps leading up to the door of the fuselage and a small, beautifully detailed valise near by, ready to be stowed away in the baggage compartment. The door which is swung open, shows the detail of construction which is exactly like that of the large ship. To cap the climax of this job, we learn that it is a flying scale model and not merely one to look at. The span is thirty and three-quarter inches.

Our expert model builders seem to be busy this month, for only an expert builder could complete the neatly built Macchi Castoldi M-72 Racer, shown in picture No. 2. The guilty person is Harvey Schubring of 1779 Bayard Avenue, St. Paul, Minn. The wing span is eighteen inches. The plane is finished beautifully in black, trimmed with red and white.

One of the finest looking jobs that has come in this month is picture No. 3 of the Boeing 95 Mail Plane, built by Dick Shipway of 2024 South Maple Street, Sioux City, Iowa. It has a wing span of thirty-three inches Details are carefully carried out.

Many readers may remember Joe Kovel who placed second with his gas job at the "Nationals." His best ship, upon which he had counted to bring him glory, was smashed inadvertently by the timers before it had a chance to get away. However, Joe, having great faith in his new ship, repaired the damage and recently put it through its paces at Peru, Vermont.

Joe is shown beside his ship in picture No. 4. It has a ten foot

Pict. No. 10. Some fine wartime models, a Spad, Albatros D-3 and Nieuport 17C-1 by courtesy of Manfred Huffman

wing spread and fifteen inches chord and weighs six and one-half pounds. It is powered with a Brown Junior engine. I am sure you readers will be interested to hear what this plane accomplished. After several trial flights which showed a glide angle of thirteen to one, and after some beautiful landings in a rough hay field, the model got away to a long flight. It rose to an altitude of fifteen hundred feet and headed for a wooded country. Joe's assistants had a difficult time following the plane as it rose to varying altitudes. The last view had by the timers was at a distance of about one mile, when it disappeared behind a wooded ridge. The ship was finally taken down unassembled; it had sustained practically no damage. Everyone was elated for it had remained in the air for twenty-three minutes. The mount of fuel used was one and one-eighth ounces; which was less than the amount it could have carried according to National Aeronautic Association specifications. The unfortunate part of this was that the flight was not official and therefore could not be classed as a record, though it did exceed Bassett's official flight of over twenty-two minutes, made at the "Nationals."

Having proved the capacity of his model to fly for a record, Joe is now "loaded for bear" and intends to make a desperate try for record time at the next contest.

While we are talking about gas jobs we wish to call your attention to picture No. 5. This is the auspicious display of gas jobs taken to the National Contest by members of the Bamberger Aero Club. Herbert Greenberg's model was the one making the best flight of the three shown. The Goodyear Dirigible Hangar may be seen in the background.

One of the interesting features of the National Competition was the "Forum" of expert model builders which was held on the roof of the Y.M.C.A. Saturday morning, after the Contest had been concluded. The meeting was held for the purpose of discussing points of interest in model construction, design and flying, which had arisen from the experiences of the builders during the past year. Picture No. 6 shows the group in the act of weighing some weighty problems. We regret that the names of some of these young men are not available. However, there are several whom we all know. They are as follows, starting from the extreme left and going around the circle:

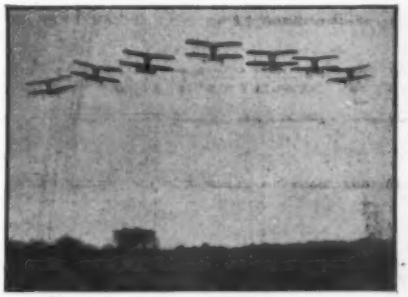
Smithline, Goldberg, unknown, Young, Marchi, unknown, Grant, Kovel, Barrack, Tyler, unknown, and Katzenberger.

We wonder how many of these names will appear in the annals of the history of future aviation.

One of the most perfect model planes that has ever been built is shown in picture No. 7. It is the "brain child" of Ben Hammer, a nineteen year old young man of Pasadena, Calif. Close examination will show that every detail of the U. S. Navy Keystone 01-9 Amphibion Observation plane has been carried out. It is built to a scale of one-eighth inch; wing span being sixty-seven and one-half inches and the weight ten and one-half pounds. All parts of the plane were made by hand, all in all, taking one thousand hours to complete. Hammer values his model at $1400. Aviation experts have pronounced this the most perfect model they have seen.

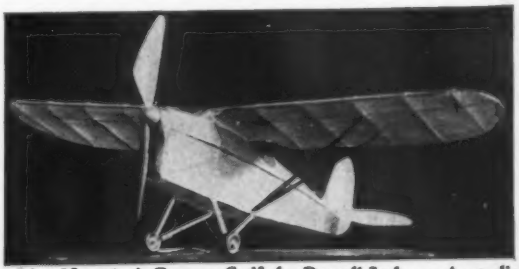
Continued on page —

Pict. No. 9. A model Boeing 95 gas job with its builder, Leonard Phillips



Pict. No. 8. A model Boeing 95 gas patrol, by D. C. Morrison

Pict. No. 12. An unusual gas job by Capt. C. E. Bowden, British record holder



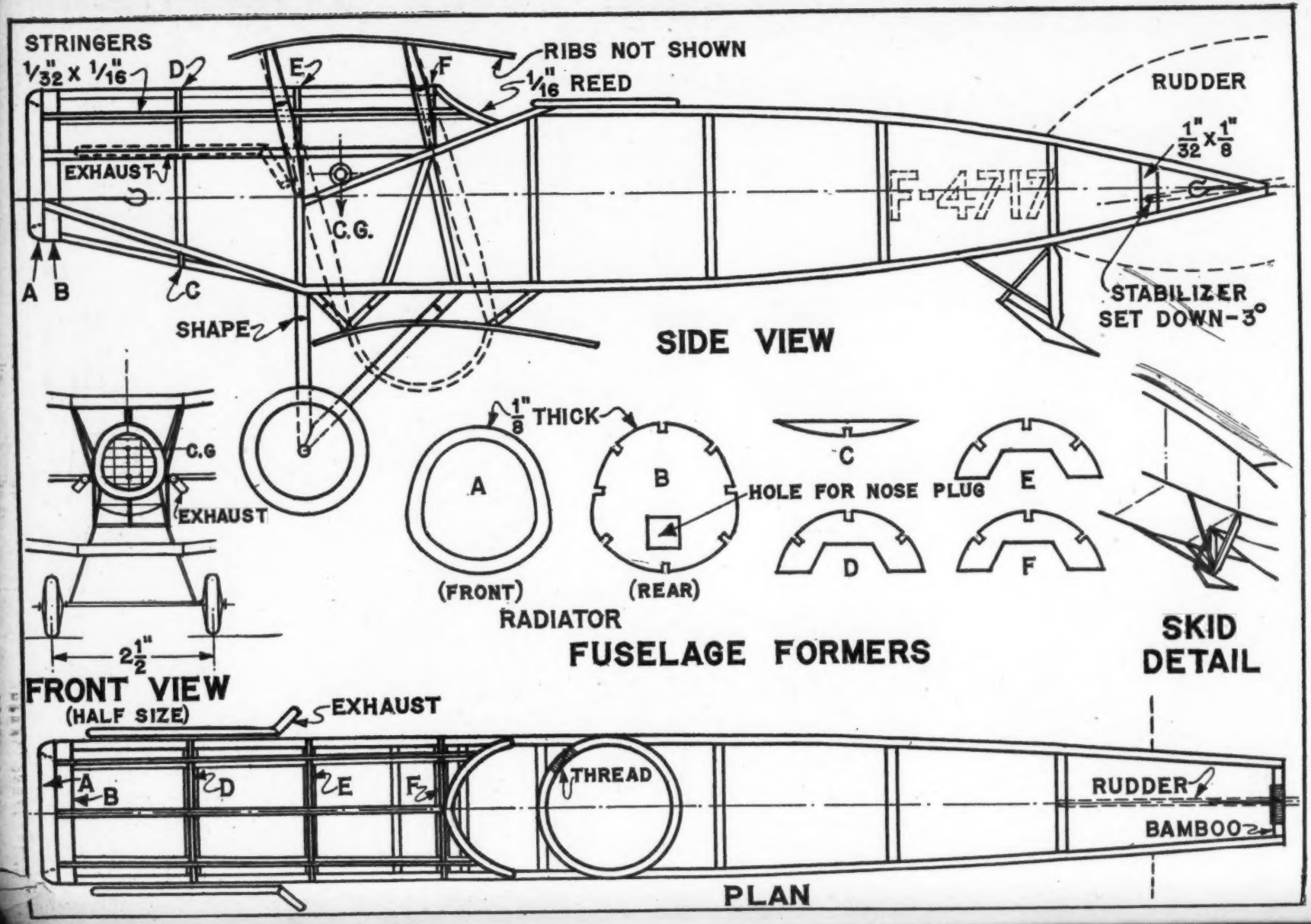
Pict. No. 11. A Comper Swift by Russell Jackson, Australia

Pict. No. 14. Adult builders of Milwaukee

Pict. No. 13. Mr. Varache an expert French model builder

Pict. No. 15. John Malloy, Ohio State Champion, and some of his trophies

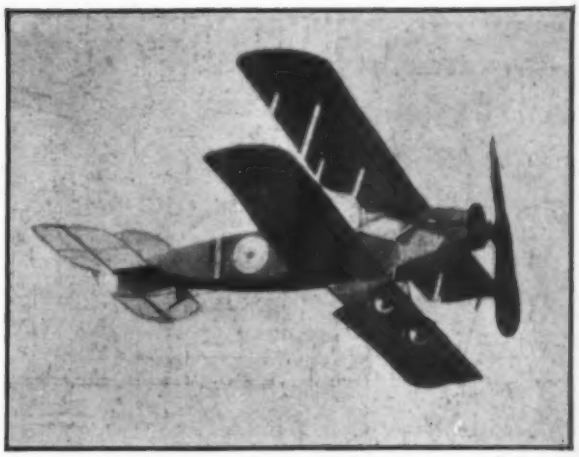
Pict. No. 16. The Atlanta, Ga. model club is very active


STRINGERS
1/32" X 1/16"
D
E
F
RIBS NOT SHOWN
1/16" REED
RUDDER
1" X 1"
32 8
EXHAUST
C.G.
A
B
C
SHAPE
STABILIZER
SET DOWN-3°
SIDE VIEW
1" THICK
8
C.G
EXHAUST
A
B
C
HOLE FOR NOSE PLUG
E
D
F
(FRONT)
(REAR)
RADIATOR
FUSELAGE FORMERS
SKID
DETAIL
2 1/2"
FRONT VIEW
(HALF SIZE)
EXHAUST
A
B
D
E
F
THREAD
RUDDER
BAMBOO
PLAN

Build and Fly This Bristol Fighter

How You Can Build a Simplified Flying Scale Model of One of the Greatest British World War Planes

By LAWRENCE McCREADY



The finished model looks like the real thing

THE Bristol Fighter was one of the finest and best known planes at the front during the war. It was a two seater but because of its sound design, high performance and unusual maneuverability, it was often more than a match for the renowned Fokker pursuits.

The model presented here is scaled closely from the real Bristol and flies remarkably well. Its flights are smooth and steady and take offs and landings are an exact imitation of the real thing. You may say "I don't like all-balsa wings—they don't look real enough," but build this little Bristol and your mind will be changed, for you can detail this model so that it looks astonishingly realistic.

Fuselage

Make the fuselage by first assembling the side frames which are shown "grained" in the plans. The material is hard balsa sanded from regular 1/16" square down to 3/64" square. When the sides are dry, connect them with the cross pieces, square the whole fuselage up accurately and hold it in form until the glue dries. Next cut and notch the formers and fit them on. The radiator is in two pieces, the front piece being cut out, making a ring which fits onto the rear piece which is itself notched and glued to the longerons. Glue this on squarely and then fit on the 1/16" x 1/32" soft balsa stringers, reed cockpit edgings and the rear hook which is mounted on a bamboo cross piece.

Cover the fuselage at this stage and dope it with a water spray. Now fit the characteristic Bristol tail skid, which is made from thin bamboo struts assembled as shown in the detail drawing of the skid. Make it as shown; don't put on a plain skid or the model will not resemble a Bristol so closely.

Tail Surfaces

The stabilizer and rudder are made up of 1/32" sq. bamboo edging and balsa framing. If you find it difficult to work with bamboo, you can make them entirely of balsa framing as shown dotted in the plans, but bamboo is recommended however. The rudder plans are shown in two sections, so trace and join the patterns to get the true shape. Cover the stabilizer on the top only and the rudder on only one side; then fit them to the fuselage. The stabilizer which is set with the front edge down at 2 or 3 degrees, must be separated in the middle and each half glued on individually.

Wings

For the wings, use clear, soft 1/64" sheet balsa. This is now sold by several supply houses, but if you wish to make it yourself, you can do so by sanding down regular 1/32" flat balsa. The wings are alike, top and bottom on both sides, and the two center sections are the same size and shape. Trace the wing pattern as given on the plan and cut two wings. Then turn the pattern over and cut the wings for the other side.

Cut out the center sections, doubling the half pattern given, and then smooth all edges off nicely. Bend the 1/32" sq. ribs of bamboo; 1/16" sheet balsa may be used for ribs if you desire. Glue the ribs well to the undersides of the wings and center sections in the positions shown.

Though it is only sixteen inches in span, it makes fine flights

To assemble the wings and center sections, coat the edges to be joined with glue and press them together. Block the tips up 5/8" to get the proper dihedral. After these joints dry hard, attach the wings to the fuselage. It is advisable to erect some sort of temporary framing to hold the wings in the proper position while the struts are being glued in.

Set the wings in the proper position, with zero incidence and 11/16" stagger. Put in the upper center section struts and the several struts between the fuselage and the lower center section slowly and carefully, for this is the most important point in building this model. Let these struts dry, then install the eight hard balsa interplane struts.

Landing Gear

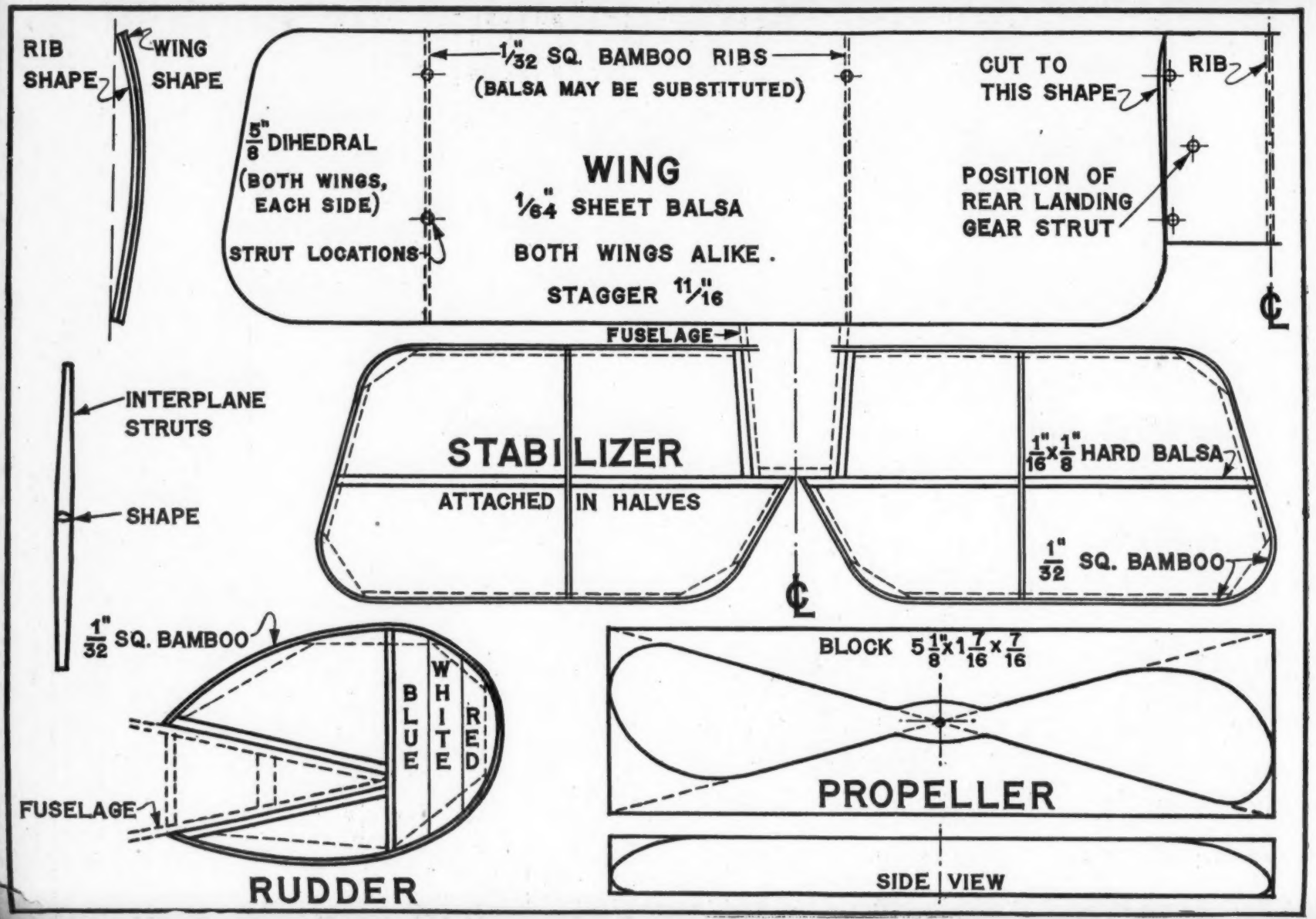
Put on the landing gear at this time. Glue the two front legs, which are bamboo as is the rest of the gear, and the 2 1/16" spreader bar on squarely. When the glue is dry, fit the rear legs of the landing gear. These go through holes made in the lower center section in the location shown on the plan. Glue all the joints well, for there is considerable strain on these parts. Glue a straight piece of wire on the bottom of the spreader bar and let the ends project enough to fit the 1" celluloid wheels. Glue small washers on the axle ends to retain the wheels.

Power

A 3/8" long nose plug carries the flat metal thrust bearing. This plug is squared at the back to fit the hole in the radiator. Carve the propeller from a hard balsa block 5 1/8" x 1 7/16" x 7/16". Carve it with the aid of diagonals drawn on the faces and don't cut the block in any fancy shape for the correct amount of blade area has been calculated and it will be changed by doing so.

Sand the prop smooth after carving, round the tips and then put in the shaft, fitting several washers and the nose plug before bending the end over finally. When this is done, put in one loop of 1/16" sq.

(Continued on page 41)


RIB SHAPE
WING SHAPE
1/32 SQ. BAMBOO RIBS
(BALSA MAY BE SUBSTITUTED)
5/8 DIHEDRAL
(BOTH WINGS, EACH SIDE)
STRUT LOCATIONS
WING
1/64 SHEET BALSA
BOTH WINGS ALIKE.
STAGGER 11/16
CUT TO THIS SHAPE
RIB
POSITION OF REAR LANDING GEAR STRUT
FUSELAGE
INTERPLANE STRUTS
SHAPE
STABILIZER
ATTACHED IN HALVES
1/16 x 1/8 HARD BALSA
1/32 SQ. BAMBOO
1/32 SQ. BAMBOO
BLUE
WHITE
RED
FUSELAGE
RUDDER
BLOCK 5 1/8 x 1 7/16 x 7/16
PROPELLER
SIDE VIEW

The Aerodynamic Design of the Model Plane

Article No. 33

Chapter No. 4

The Design of Rubber Motors and Results of Tests Showing Relative Value of Rubber of Various Quality and Size

By CHARLES HAMPSON GRANT

IN ORDER to calculate accurately the power delivered by a motor of any type, it is necessary to understand how the various factors that enter into the problem act, and what their exact values are under certain conditions.

In rubber motors, the values of all the factors but one may be calculated. The number of turns, the torque, the size of the rubber, the number of strands and the speed of propeller rotation, can all be determined. However, the quality of the rubber which effects the value of all these factors, often remains somewhat of a mystery unless special tests are made.

This is why it is best to consider all values given about rubber motors as relative and not actual, for different values of torque and turns result from different qualities of rubber, when used in motors. This fact is important insomuch as rubber quality has a large degree of variation, depending upon the composition, manufacture and age of the product. The same brand and product of the same process of manufacture often varies in quality from one time to another. In fact, rubber quality is always an unknown quantity to the model builder.

This makes it necessary to say something about the quality of the rubber used in the test presented and discussed in this and the last two instalments of this series. Builders can then have a basis for comparing the probable results they will obtain with rubber of various other qualities.

The black rubber used was of exceptionally good quality, in fact superior to most rubber used for model motors. It was made to a special formula by the U. S. Rubber Company for one of the model manufacturing concerns. The rubber was not "green" but had been manufactured long enough to have ripened to a degree which would give maximum elasticity and tension.

When it is first manufactured, rubber is comparatively gummy and soft. From this condition, it gradually passes through a change in quality with the passing of time, becoming harder or more brittle with age. There is a point in this process of change at which the rubber will deliver the greatest amount of work. After this point, the rubber becomes too brittle for efficient results and eventually will fall to pieces with the slightest touch.

The rapidity with which this ripening process and gradual disintegration takes place, depends upon two things, exposure to air and to light. Of the two, light has by far the greatest effect.

If ripe rubber is left exposed to intense light and the air for even a day, it is liable to have lost much of its capacity for delivery of energy. It will probably require about two weeks for rubber to become worthless when it is left lying around under normal light conditions. At the end of six months, it will be so disintegrated that it may be broken up readily into small pieces without any effort.

If rubber is left exposed to the air but in a dark place, the hardening process will take about ten times as long. In fact, if it is kept in an air-tight can or jar, it will remain quite fresh for six months to a year.

The brown rubber used in these tests was supplied by one of the concerns advocating the use of this kind of rubber. The quality of the rubber was represented as being that of the normal run of brown rubber. However, it has been since stated by this concern that its quality was not quite up to standard and that the best grade of brown rubber will give better results. In order to determine this fact accurately, it would be necessary to make further tests with other grades of brown rubber.

In considering the tables and charts given in the last two articles of this series, (September and October issues), the values of turns and torque may be taken as values of average run brown rubber or possibly slightly less than average. The values that would be given by the highest quality rubber of this type, might be slightly larger.

In light of these facts, suppose we compare the values of turns, torque and work, for black and brown rubber of the grades tested.

The tables No. 1 and No. 2 on page 23 of the September issue, show that for motors of two strands, the maximum number of turns it is possible to store in brown and black rubber is the same. However, as the number of strands in the motors increase, black rubber will absorb a slightly greater number of turns. In the case of eight strands per motor, an increase of about 12% is indicated and with ten strands, about 5%. These results are obtained without the use of lubricant, wound by hand.

Now, when lubricant is used, brown rubber will absorb more turns than black rubber as can be seen from tables No. 5 and No. 6. The increase in turns for brown rubber over black rubber is about 4% with two strands in each motor. However, as the number of strands in the motors increase to eight and ten, black rubber has the advantage. It will take about 5% more turns in these cases.

On the whole, these tests show that the black rubber tested was capable of absorbing as many turns as brown rubber under all conditions except one, and in most cases, more turns.

The next important factor to consider in the case of these two qualities of rubber, is the *torque*. Again let us look at tables No. 1 and No. 2, page 23 of the September issue. We see that the black rubber gives greater torque than brown rubber in every case of various numbers of strands used. The increase in the torque varies from about 2% to 10%.

When lubricant is used as shown in tables No. 5 and No. 6, brown rubber has a slight advantage over brown rubber. This advantage varies from 3% to about 9%, the largest variation occurring when eight or ten strands are used.

However, in all these comparisons, it must be noted that brown rubber is heavier per unit length than black rubber. In the tables it is shown that brown rubber weighs one ounce for every 14.5 feet of rubber and black rubber weighs one ounce for every 17 feet. This, however, is a misprint. The values should be one-half ounce for every 14.5 feet of brown rubber and one-half ounce for every 17 feet of black rubber. Thus, there is 29 feet of brown rubber to the ounce and 34 feet of black rubber to the ounce. From these facts, it can be seen that black rubber is about 15% lighter than brown rubber.

Though lighter in weight, black rubber shows itself to compare favorably with brown rubber in all cases and in most cases better. The conclusion may be drawn therefore, from these figures, that an equal weight of black rubber will either deliver *equal torque and more turns per ounce*, or *equal turns and greater torque per ounce* than brown rubber, depending upon whether the extra black rubber making up the difference in the weight of the two kinds is added to the length of the motor or to its cross section area. Thus, ounce for ounce, we can correctly conclude that black rubber will absorb and deliver more units of work than brown rubber.

This conclusion is contrary to the popular belief of most model builders, up to the present moment. However, the facts given here, prove that of the two qualities of rubber used in the tests, the black is superior for powering your model. If there are model builders who feel that the samples of rubber used were not of normal quality, or that these tests are not as accurate as they should be. I suggest that they make a series of *accurate* tests in order to determine the relative values of the two types of rubber for themselves. The values given here are accurate for the samples tested but the possibility is not

(Continued on page 40)

An Open Forum for Readers, What They Think, Do and Say, Presented So That All Who Read May Enjoy and Benefit by an Exchange of Ideas

We cordially invite all our readers to make use of this department of the magazine to present their ideas, criticisms, arguments and commendations, on *all* phases of aviation. If you feel that any idea presented herein warrants commendation or criticism, write, telling what *you* think about it, so that by debate, "truth" may be determined. Address all letters to "SLIPSTREAMS."—*The Editor.*

A NUMBER of the ideas which follow may be of great value to our readers. They have been sent in to UNIVERSAL MODEL AIRPLANE NEWS by model builders who believe they have something that will help other readers. Perhaps, you have tried these out and have found them more or less practical. Any comments, favorable or otherwise that you wish to make concerning them, will be gladly received. This is your column in which you can "air" your views freely.

Joseph F. Morris writes us and gives a new slant on hard wood construction in model planes. Perhaps some of you may not agree with him; however, his viewpoint is a valuable one inasmuch as it is based upon the fact that he is following model building for what it will teach him, not merely for the "fun" he can get out of it. He writes as follows:

Balsa vs. Hard Wood

"In the January issue of UNIVERSAL MODEL AIRPLANE NEWS, in the article entitled "Model News from Other Countries," you mention that some of our friends in Brisbane scorn to use balsa wood in model construction, and you profess to be unable to understand why they do not. In your usual manner, you insist that their machines will give finer flights if made of balsa and that balsa is easier tn handle.

Balsa recommends itself to model work, of course, because of its lightness. There its advantages end. It seems that American model builders have entirely lost sight of the original purpose—that of building miniature replicas of powered aeroplanes that would fly, and have been building successively lighter and lighter planes until in reality what we call "model aeroplanes" are nothing but powered model gliders in the shape of aeroplanes. There is one Lockheed "Vega" on the market, from which the writer built a model, studiously following instructions. Surely it flew well—if one could call such performance flight. The propeller turned over about forty times a minute and the ship flew with all the grace of a dignified old gentleman leading a minuet. Once in the air in a slight breeze, it was almost necessary to shoot it down to make it land. Glides, soarings, dips and floatings—for all the world like a model dirigible well inflated with hydrogen and anxious to become an angel. I submit that there isn't by any criterion a real model of a Lockheed "Vega". All the "Vegas" I have ever seen got up into the air with a rush and flew as though they intended to go somewhere and landed with a sweeping rush.

"Deliver me from balsa floaters, please. I have built both kinds and I agree with our friends from Brisbane. To anyone who has built a heavier model, there is nothing quite like the thrill of seeing it swoop and zoom like the real ship. As to duration—that is, for the most part, dependent upon design both of the ship and propeller, and power plants suited to the ship, rather than lightness of structure.

"Balsa is easier to work, you say. Certainly it is. Almost any bumble-fingered ten-year old who can handle a broken razor blade and a scrap of sandpaper can make a balsa model of a sort, and may even get flying performance out of it, but it takes a real workman to make spruce and hardwood do his bidding. He must be able to handle edge tools intelligently. The making of a real model in the heavier woods gives a sense of accomplishment that the balsa stuff can't give.

"Two balsa machines can be constructed while one of the harder woods is being built, you say. What of it? Who in the world, if he is a real model builder, is so insane as to suppose that a really good model can be built, in balsa or anything else, in a few minutes or hours?

"And has it ever occurred to you that perhaps those friends from Brisbane, Australia, in choosing what might seem to be the hardest way to model performance, might just be proud enough of their skill and craftsmanship to wish to show up some of our American dabblers in balsa, and prove to the satisfaction of both that they need not slavishly follow a construction practice which, in the last analysis, has less to recommend it than one might think?"

It is evident that Mr. Morris has given this matter considerable thought. Do you believe that he is correct in taking this attitude?

Bud Smith evidently has an imagination and is interested in developing original ideas. There are several points in his letter which might bear discussion, so, we will let you read what he has to say with the hope that you will write us what you think about them. He says:

An Unusual Plane

"UNIVERSAL MODEL AIRPLANE NEWS is a very instructive magazine but I think if you printed a course in real airplane design your readers would enjoy it more. Here is a picture of a plane which I designed myself, (Fig. No. 1). It has many new features which I think will be used on future airplanes. They are: first, the long pointed nose in the front of the motor cowling, which is set in approximately the center of the plane. The nose is hollow back to the cowling. From the motor there runs a set of gears which becomes smaller progressively until it connects with the drive shaft, which is about one foot long. With a high powered motor and this set of gears, the propeller would turn three times as fast as an ordinary propeller mounted directly to the motor shaft. This would drive the plane at a terrific speed with open throttle, and in a dive too.

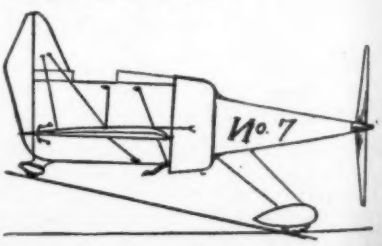


Fig. No. 1

"Second, the position of the wings which are set near the rear of the fuselage. They are equipped with ordinary ailerons, but the rest of the trailing edge is constructed so as to act as an elevator.

"Third, the position of the motor. The motor is placed approximately at the center of the plane."

Many of our readers may have doubts concerning the practicability of this arrangement. Evidently Smith has not considered it necessary to locate the weights of his plane so that it will balance correctly in flight. However, this idea may be a valuable one, though its practical application is in error. What do you think?

Bud also offers another suggestion, as follows:

"The lateral stability of a plane may be increased by placing a vertical fin at the tip of each wing."

Have any readers tried this idea? If so, what have been your results?

Mr. Alan D. Booton, who is an old friend of UNIVERSAL MODEL AIRPLANE NEWS, sends us an idea which may be of value to autogiro fans. It is an autogiro vane hub, shown in Fig. 2. Mr. Booton writes, concerning it, as follows:

Rotor Hub Plate

The features of this type rotor hub for flying model autogiros are the double acting vane angle stops and the removable

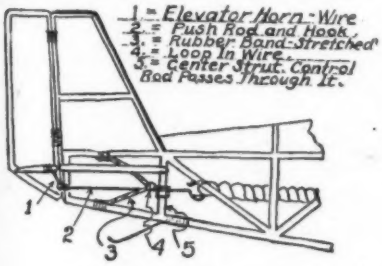


Fig. No. 3

hinge pin that permits easy dismantling of one or all vanes. The hub is strong and light and if coated with cement when finished, will stand a lot of punishment.

The drawing is self explanatory except for a few details. To take advantage of the grain in the wood, the hub is made of separate pieces cemented together. A hand-made paper bushing is inserted through the exact center and cemented. Then the slots are cut to fit the stub spar stock, stub spars cut to size, and all hinge parts fitted with paper bushings cemented in. The hinge pins have "U" heads so the short ends can be pushed in the side of the hinge.

Note the bevel at the bottom of the hinge on the drawing. The angle begins exactly under the bushing to permit free movement of the stop plate when the vanes are in motion.

A plate of thin, hard sheet balsa is cemented to the bottom of the stub spar as shown on the detail. This plate holds the vane in horizontal position at rest and also prevents the vane from rising past the bevel angle during compensation.

Note the end view of vane hinged to hub. Experiments have shown that a slight helical pitch in the vanes improves the flying qualities of model autogiros.

The streamlining at section X-X gradually washes out near the first vane rib to permit a neater covering job.

Another method to attach vanes to a hub is to use pieces of music wire having the proper tension, between rotor hub and vanes. This eliminates the large hub, hinges, vane stops and rubber tension assembly. The greatest requirement in this method is patience enough to determine the most efficient size and length of wire to use.

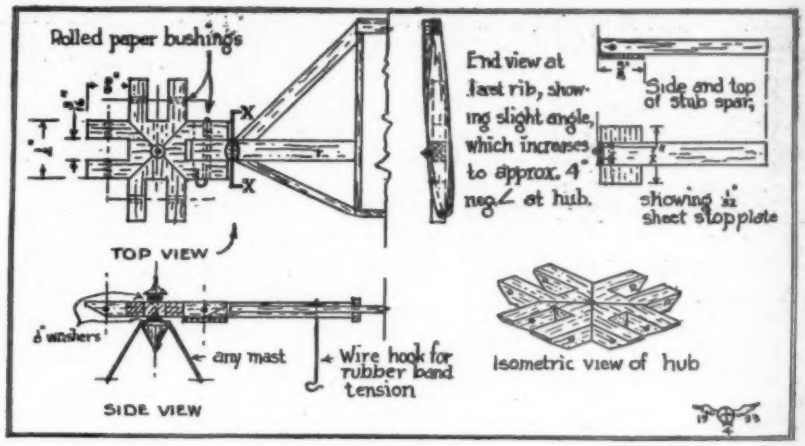


Fig. No. 3

The stability of airplanes always seems to be a difficult problem for model builders to conquer and they are continually trying to find some way to insure the stable flight of their model. There are two ways to do this: First, by designing your plane correctly and in such proportion that it will fly with great stability; or, second, devise some means which will work automatically to correct any deviation from the normal flight positon. By the second method, the plane which is poorly designed and may not fly under ordinary conditions, will be able to make a flight because of the automatic action of the stabilizing device.

Evidently Mr. Forrest Jones has seen the need for an automatic stabilizer, for he sends us the following idea:

Automatic Stabilizer for Model Airplanes

A fault common with a great many model airplanes is that after taking off they climb too steeply, stall and crash. To correct this, the wing is set back a trifle or more weight is placed in the nose of the plane, also the elevators may be pushed down a bit. In each of these cases we were considering the take-off only. After the motor is unwound and the plane starts coming to the ground, it comes down in a very steep glide, which usually results in damage to the model.

To correct this fault an "automatic stabilizer" may be installed in the model plane.

Its operating principle is shown in Fig. No. 3. When the motor is wound up tight, the tension of the motor being greater than that of the rubber band, the device pulls the control rod ahead, thus pulling the elevator *down*, which insures a safe angle of climb.

As the tension of the motor decreases, the elevator is pushed up midway in its flight. Then as the rubber motor unwinds entirely, the elevator is pushed up through the use of a rubber band and the plane comes down in a long level glide, instead of a nose dive.

This idea is extremely fine. Has Jones applied it correctly to his model? What will happen when the motor band tries to twist the push rod and hook? Should there not be a slight change of construction in order to make this practical?

Joseph C. Tighe is a young man who believes in thinking things out for himself. He writes as follows:

"Some time ago I saw an article in another aviation magazine. It stated that it is impossible for a plane to fly 500 m.p.h. The author said the friction set up between the plane and the air would burn the plane. He based these statements upon the facts that a bullet becomes heated in its flight through the air; that air causes an outlet to heat, such as does an auto tire pump, and some mathematical figures which were not very clear to me. He also stated that the vast power plant required

(Continued on page 32)

NATIONAL AERONAUTIC ASSOCIATION
JUNIOR MEMBERSHIP NEWS

Prepared by—National Aeronautic Association, Washington, D. C.

New Records

AT Lakehurst, New Jersey, on September 1st, in the small hangar that is used for non-rigid dirigibles, Mayhew Webster of Philadelphia established two new indoor records. What makes these records all the more remarkable is the fact that the available height in the small hangar is only eighty-five feet.

Webster's records are 19 minutes 56 seconds for a Class C stick model and 10 minutes 17.6 seconds for a Class A stick model (Baby R.O.G.). The latter is a senior record which still falls slightly below the junior record for that class, 10 minutes 25 seconds which is held by Joseph Pruss.

All three of Webster's Class C flights were over 19 minutes and on his two best attempts, the model did not touch the rafters. This is remarkable indoor flying and marks Webster as one of the country's outstanding performers.

The meet was conducted by Mr. Jesse Bieberman for the members of the Philadelphia Northeast Chapter. Jesse Jessen placed second in the Class C event with 16 minutes 35.2 seconds. In the Baby R.O.G. event, Hyman Oslick placed second with 8 minutes 30.2 seconds.

The Philadelphia model flyers have demonstrated on numerous occasions that they have a complete mastery of the art of indoor flying. This is undoubtedly due to the active program of meets that are held under the direction of the Philadelphia Model Aeroplane Association. Certainly, practice is of paramount importance in model airplane construction and flying.

New Committee Members

THE Association's President, Hiram Bingham, has named four outstanding authorities on model airplanes to the N.A.A. Model Airplane Committee. These are Mr. Percy Pierce of Philadelphia; Captain Willis C. Brown, Boston; Mr. H. M. Jellison, Akron; and Mr. Ernest A. Walen, Springfield, Mass. Each of these gentlemen has been identified with the science and sport of model planes for many years.

Mr. Percy Pierce was a national figure in the model plane world more than twenty years ago and has maintained his interest actively ever since he started. He is Secretary of the Aero Club of Pennsylvania, an N.A.A. Chapter which is one of the sponsors of the Philadelphia Model Aeroplane Association. One of his present interests is gliding and he is a licensed glider pilot. The oldtimers in model airplane matters recall the regularity with which the name of Percy Pierce appeared at the top of the winners' lists in those former days.

Capt. Brown earned his military title as an officer in the United States Army where he served in the Signal Corps until retirement several years ago. Always interested in aviation, he associated himself with the sponsors of the Jordan Marsh-Boston Traveler Junior Aviation League as club advisor and is exceptionally well qualified for this post. Under his guidance the Boston model enthusiasts have been granted a junior Charter, having one of the most active clubs in the country.

Experimental gasoline model constructed by Robert Willoughby, Gray Clifton and Franklin Shea of Kansas City. It has flown over 14 minutes on seven-eighths ounce of fuel

Mr. Jellison is well known as the directing head of the Association junior activities in Akron, Ohio, where he has more than four hundred under his leadership. Those N.A.A. junior members who attended the 1934 National Championship Meet remember him as the energetic and efficient Field Judge. In other words, Mr. Jellison ran the actual contest activities at the airport and in the Goodyear-Zeppelin Airdock. His interest in model aviation dates back beyond the memory of most of the Association's junior members.

Mr. Walen needs no introduction to many. He has been building and flying models and attending meets as contestant, official and observer since 1910. Through his interest, Springfield, Massachusetts, has an active model club known as the S.M.A.C. which includes members of widely separated ages. The oldest member is over forty and is just as active as the youngest in his building and flying. Through the generosity of Mr. Walen, the N.A.A. has the Springfield Trophy for annual competition by open class contestants in the indoor stick model event at the National Championship Model Plane Meet.

The complete membership of the Model Plane Committee is: H. W. Alden, Chairman; Willis C. Brown, H. Weir Cook, Paul E. Garber, H. M. Jellison, George C. Johnson, Percy Pierce, Irwin S. Polk, Ernest A. Walen. The chief function of this committee is to advise the N.A.A. Contest Committee on model airplane questions and as such, the committee is only an advisory one. All matters of an official nature are submitted to the Contest Committee for decision, just the same as all matters concerning large aircraft sporting competition.

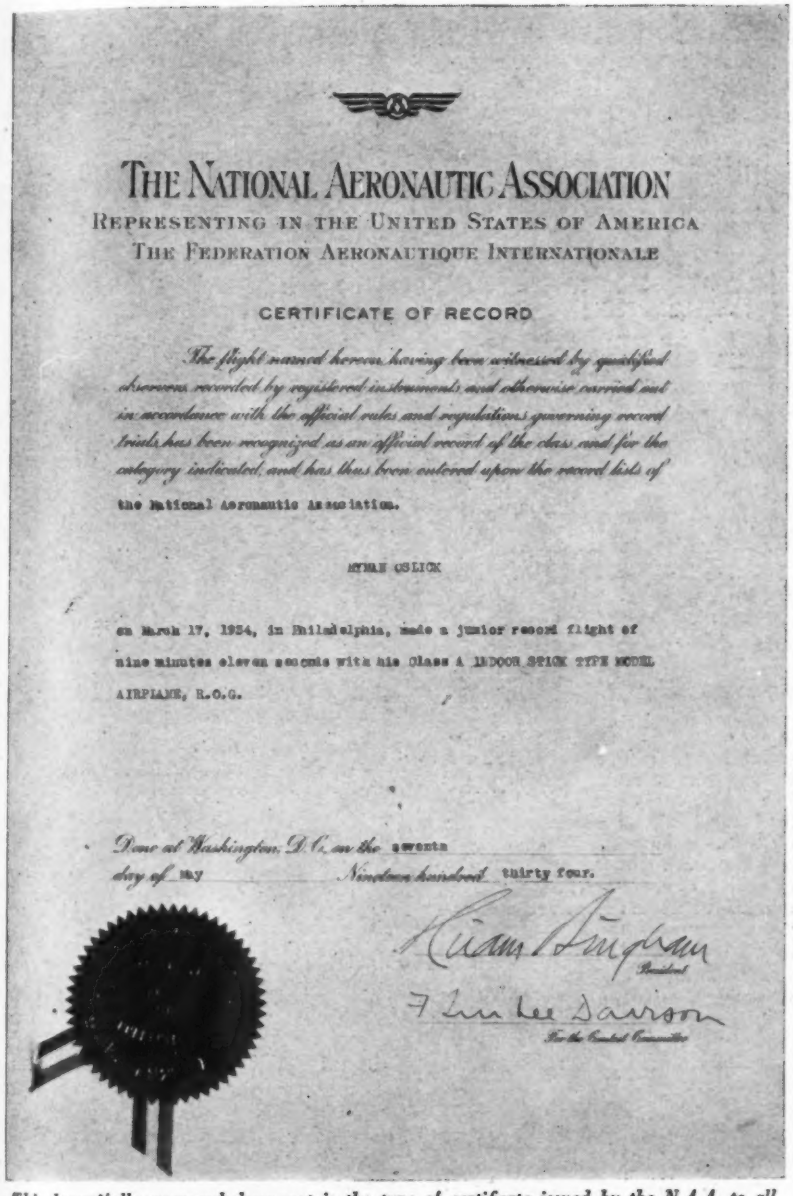
News from the Chapters

FRESNO, California, Chapter plans to hold an indoor meet in the Fresno Civic Auditorium on November 10, 1934. There are to be many events on the contest program open to anyone who wishes to enter. Full information may be obtained by writing to Howard Roberts, Route 1, Box 419, Fresno, California. This meet is a part of the three-day Armistice celebration.

NORTH CANTON, Ohio, has a new junior charter from the N.A.A. with Mr. Dwight Harsh in charge as Senior Advisor and William Danner the Junior Advisor. Club headquarters are in the North Canton Community Building and anyone interested should communicate with Mr. Harsh at that address. There is a committee of six adults responsible for the club: M. R. Bixler, A. J. Schneider, Ray Swope, Charles Schaffer, Frank Stover and H. J. Ginther. The club plans to hold contests and exhibits regularly.

NEWARK'S N.A.A. Junior Chapter, the Bamberger Aero Club, held its second annual model airplane convention on September 8 in the club's convention hall on the tenth floor of Bamberger's store. The program opened at ten in the morning and continued right through to seven in the evening. Thirty enthusiasts were invited.

The purpose of these annual conventions is to gather together for discus-



THE NATIONAL AERONAUTIC ASSOCIATION

REPRESENTING IN THE UNITED STATES OF AMERICA
THE FEDERATION AERONAUTIQUE INTERNATIONALE

CERTIFICATE OF RECORD

The flight named hereon, having been witnessed by qualified observers, recorded by registered instruments and otherwise carried out in accordance with the official rules and regulations governing record trials, has been recognized as an official record of the class and for the category indicated, and has thus been entered upon the record lists of

the National Aeronautic Association.

MYRON QUICK

on March 17, 1934, in Philadelphia, made a junior record flight of nine minutes eleven seconds with his Class A INDOOR STICK TYPE MODEL AIRPLANE, R.O.G.

Done at Washington, D. C. on the seventh
day of May *Nineteen hundred* thirty four.

This beautifully engraved document is the type of certificate issued by the N.A.A. to all record holders. This illustration is reduced, full size being 8½ by 12½ inches

sion and exchange of ideas, a large number of outstanding model plane builders and flyers as well as a number of officials. Among the better known N.A.A. junior members to attend were: Gordon Light, Herbert Greenberg, August Ruggeri, Norman Schaller, Frank Zaic and the club's Secretary, Mary Walker.

Guest speakers included "Casey" Jones, Philip Zecchitella, Victor Fritz, John Hulstrunk, Lawrence Shaw, John Carisi, Robert Meagher and Irwin S. Polk. The N.A.A. Contest Committee was represented by Lieutenant Alden. The convention was under the leadership of Nathan Polk, the Club Director.

An excellent lunch was served to all those in attendance and it was unanimously declared that the convention was a complete success, but that once a year is not often enough.

Model Plans

THE N.A.A. plans to publish a drawing of an indoor contest model each month during the winter and one of an outdoor contest model each month during the spring in these pages. These models will be outstanding performers and record holders and should prove to be well within the construction ability of the average advanced builder.

It is not intended that these advanced models should be attempted by the inexperienced beginner. The first drawing will appear in the next issue.

THE National Aeronautic Association offers you model builders and flyers membership in a national aviation organization that insures recognition of record making flights, quarterly bulletins that will keep you up to date in the latest refinements of the art, together with the realization that you are working right along with the leaders in national aviation. The Association aims to keep "America First in the Air." Those under twenty-one are entitled to membership as junior members at twenty-five cents a year with an additional initiation fee of twenty-five cents. Those over twenty-one may become regular members at five dollars a year. A special model flying permit is offered to non-members who are over twenty-one at one dollar a year.

Only N. A. A. members or those with special permits are eligible to compete for N. A. A. trophies and awards, or to have their flights given official recognition for record purposes. As the representative in the United States of the Federation Aeronautique Internationale, the Association has as a special responsibility the encouragement and regulation of air meets, races, and record trials.

NATIONAL AERONAUTIC ASSOCIATION OF U. S. A.
DUPONT CIRCLE
WASHINGTON, D. C.

I hereby make application for membership in the National Aeronautic Association as a Junior Member. I am under twenty-one years of age.

I enclose fifty cents for initiation fee and first annual dues (Use check or money order.)

Name .....
(Please print or type)

Street .....

City ..... State .....

Date of Birth .....
(Month, Day, Year)

Approved .....
(Parent sign here, if applicant is under eighteen)

List of Records

DUE to so many requests for a continuous and up to date list of model airplane records and their holders, it has been decided to print the most recent list once a month as a part of the Association's Junior Membership News. Accordingly, the accompanying list is the second one in succession and shows how the records stand up to and including September 10, 1934. It is believed that this will prove to be a popular decision as it will provide a handy reference to the progress of model flying skill.

It is considered that several changes will take place in the record standing every month so that the repetition of the list each month will not become stale news. Just at present the Philadelphia fellows seem to have a corner on more than their share of records but there is going to be plenty of tough competition for them and the rest of the country's model flyers are making great strides toward improving their own showing.

On September 15, just after this goes to press, there is to be an invitation indoor meet in the large hangar at the U. S. Naval Air Station at Lakehurst. Twenty contestants have been invited to attend. These include some of the most active and most experienced builders in the East, so it is confidently expected that there will be a number of new indoor records as a result.

Lieutenant Commander C. E. Rosendahl, U. S. Navy, who is in command of the Lakehurst station, has shown a keen interest in model flying and it is largely through his influence that the Navy Department has granted the use of the hangar for one day.

Sanctioned Meets

THE question has often been asked whether ther is any age limit for contestants in a model plane meet that is being held under N.A.A. sanction.

As far as the rules for model plane competition are concerned, there is no age limit imposed that is binding on the sponsors of a meet. In other words, it is entirely up to the sponsors to set up their own desired limits. Thus, it is quite within the rights of the sponsors to limit the meet to those under fifteen, say, or to contestants between ten and twenty-one, or to make their meet for those of any age class which they wish. The N.A.A. is inclined to the belief that all ages should be encouraged to enter a meet just as a general rule to promote interest in model flying. It is not necessary that there be elaborate awards to be contested for by different age classes in what might appear to be uneven competition. The sponsors could arrange to give prizes to only that particular age group which interests them most, yet at the same time give everyone who wishes, an opportunity to fly under contest conditions.

OFFICIAL MODEL AIRPLANE RECORDS

Approved by Contest Committee of the N.A.A.

Through September 10, 1934

INDOORS

STICK MODEL AIRPLANES, Hand-launched

CLASS B

Junior: Raymond Steinbacher	Ridgefield, New Jersey	9m 07s
Senior: Ralph Kummer	St. Louis, Missouri	17m 49.8s
Open: Frank Zaic	New York City	6m 57.2s

CLASS C

Junior: John Stokes	Huntingdon Valley, Pa.	18m. 53.4s
Senior: Mayhew Webster	Philadelphia, Pa.	19m 56s
Open: Carl Goldberg	Madison, Wisconsin	22m 59.4s

STICK MODEL AIRPLANES, R.O.G.

CLASS A

Junior: Joseph Pruss	Philadelphia, Pa.	10m 25s
Senior: Mayhew Webster	Philadelphia, Pa.	10m 17.6s

CLASS B

Junior: Louis Shumsky	Atlantic City, New Jersey	9m 15.2s
Senior: William Latour	Philadelphia, Pa.	12m 46s

STICK MODEL AIRPLANES, R.O.W.

CLASS A

Junior: James Shivler	Philadelphia, Pa.	3m 41.8s
Senior: Paul Karnow	Philadelphia, Pa.	5m 01.4s

CLASS B

Junior: James Mooney	Philadelphia, Pa.	8m 37.6s
Senior: Mayhew Webster	Philadelphia, Pa.	11m 55s

GLIDERS, Hand-launched

CLASS A

Junior: Hewitt Phillips	Belmont, Mass.	21.6s
Senior: David B. Hecht	New York City	34.4s

CLASS B

Junior: Stanley Congdon	Glen Ridge, New Jersey	15s
Senior: David B. Hecht	New York City	31.6s

CLASS C

Junior: Stanley Congdon	Glen Ridge, New Jersey	17s

AUTOGIROS

Junior: Raymond Steinbacher	Ridgefield, N. J.	54s
Senior: Alton H. DuFlon, Jr.	Ridgefield, N. J.	2m 01.2s

FUSELAGE MODELS, R.O.G.

CLASS B

Junior: Theodore Golomb	Philadelphia, Pa.	6m 26s
Senior: Herbert Greenberg	Newark, New Jersey	12m. 23.5s

CLASS C

Junior: Hyman Oslick	Philadelphia, Pa.	12m 59.4s
Senior: Emmanuel Enderlein	Philadelphia, Pa.	13m 24s
Open: Jesse Bieberman	Philadelphia, Pa.	6m 31.2s

FUSELAGE MODELS, R.O.W.

CLASS B

Junior: John Stokes	Huntingdon Valley, Pa.	3m 23s
Senior: William Latour	Philadelphia, Pa.	2m 43.6s

OUTDOORS

STICK MODEL AIRPLANES, Hand-launched

CLASS C

Junior: Bruno D'Angelo	Philadelphia, Pa.	8m 29.4s
Senior: Vernon Boehle	Indianapolis, Ind.	15m 00s
Open: Bernard Collins	Providence, R. I.	3m 23s

CLASS D

Junior: Fred Skafec	Akron, Ohio	8m 21.6s
Senior: Ralph Kummer	St. Louis, Missouri	20m 54s
Open: Frank Zaic	New York City	1m 27s

GLIDERS, Tow-launched

CLASS C

Senior: Bob File	Columbus, Ohio	23m 13s

CLASS D

Junior: Stanley Congdon	Glen Ridge, New Jersey	45.2s
Senior: Fred Korn	New York City	1m 16.2s

AUTOGIROS

Senior: Ralph Kummer	St. Louis, Missouri	2m 06s

FUSELAGE MODELS, R.O.G.

CLASS C

Junior: Donald Mertens	Erie, Pennsylvania	1m 44s
Senior: Russell Yungbluth	St. Louis, Missouri	11m 35s
Open: Bernard Collins	Providence, R. I.	2m 56s

CLASS D

Senior: Vernon Boehle	Indianapolis, Ind.	8m 43s
Open: Michael Lichstein	Philadelphia, Pa.	1m 28s

CLASS E (Gasoline Engine)

Senior: Maxwell Bassett	Philadelphia, Pa.	21m 57s
Open: Carl V. Carlson	Chicago, Illinois	6m 48.5s

Illustrated Aviation Dictionary

Many model builders and other readers are often in doubt with regard to the meaning of common aeronautical words. A number of them will be defined each month, therefore, in order to give readers a larger scope of understanding

By EDWIN T. HAMILTON

119. **ENTERING EDGE.** Same as *leading edge.*

120. **EXTRA LIFTING SURFACE.** A small supporting surface or wing placed beneath the fuselage and between the two wheels of an airplane. This extra wing was employed on several airplanes used in the World War by the German Air Force.

121. **FABRIC.** A fine, closely woven linen comprising both strength and lightness which is used to cover the airfoils and fuselage of an airplane. Usually Irish linen.

122. **FACTOR, DYNAMIC.** The ratio between the load carried by any part of an airplane when accelerating and the corresponding basic load.

123. **FACTOR OF SAFETY.** The ratio of the ultimate strength of a member of the maximum probable load in that member in actual use.

124. **FAIRING.** An auxiliary member or structure whose primary function is to reduce head resistance or drag of the part to which it is fitted. In general, it does not contribute strength.

125. **FALSE RIB.** A short fore-and-aft rib, sometimes referred to as a *former rib*, or an incomplete rib, which frequently consists of only a curved strip of wood extending from the leading edge of the wing to the front spar of that wing. This rib is so designed as to maintain the desired form of the wing at its point of greatest curvature.

126. **FIN.** A small, fixed auxiliary surface attached to aircraft to promote stability. (2) A fixed surface, attached to a part of the aircraft, parallel to the longitudinal axis, in order to secure stability; for example, tail fin, skid fin, etc. Fins are usually vertical and sometimes adjustable.

127. **FIN, HORIZONTAL TAIL.** Same as *stabilizer.*

128. **FIN, VERTICAL TAIL.** A small, fixed auxiliary, vertical surface, attached to the tail of an airplane directly in front of the rudder.

129. **FITTING.** A term used to denote any small part used in the structure of aircraft; usually used in reference to metal parts.

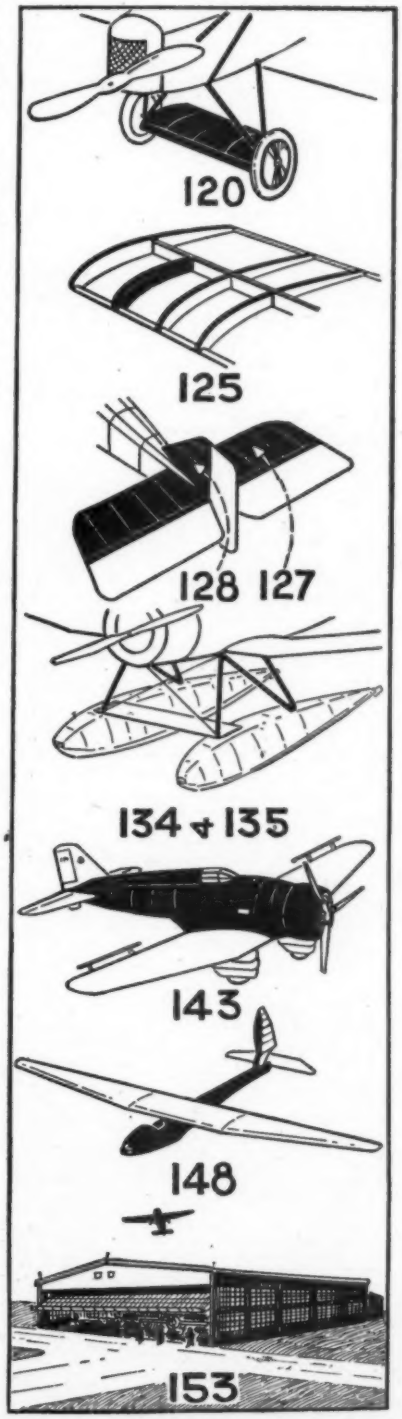
130. **FIXED SURFACE.** Same as *fin.* See *fin.*

131. **FLIGHT, CROSS-COUNTRY.** A flight which necessitates leaving the vicinity of a regular landing field.

132. **FLIGHT INDICATOR.** See *Indicator, Flight.*

133. **FLIGHT PATH.** The path of the center of gravity of an aircraft with reference to the earth.

134. **FLOAT.** An enclosed, watertight structure, which is a portion of the landing gear of an airplane and which provides buoyancy when in contact with the surface of the water.



135. **FLOAT TYPE LANDING-GEAR.** A landing-gear which supports an aircraft by means of floats. See *float.*

136. **FLOATATION GEAR.** An emergency gear attached to a landplane to permit alighting on the water and to provide buoyancy when resting on the surface of the water.

137. **FLYING BOAT.** A seaplane. An airplane whose fuselage consists of a hull or hulls, which provide floatation on water.

138. **FORE-AND-AFT AXIS.** Same as *longitudinal axis.*

139. **FORMER RIB.** Same as *false rib.*

140. **FRAMEWORK.** An expression used in reference to the general skeleton form of the airfoils or fuselage of an airplane, or the skeleton structure of a rigid airship.

141. **FRONT SPAR.** Front wing spar. See *wing spar.*

142. **FUEL CONSUMPTION, SPECIFIC.** The weight of fuel (or oil) consumed per brake horse-power-hour.

143. **FUSELAGE.** Body. That portion of an airplane to which the wings, tail unit and landing-gear are attached. It is streamlined and it contains the power plant, cockpit or cabin for pilot and passengers, cargo, gasoline, etc.

144. **FUSELAGE, MONOCOQUE.** A type of fuselage construction wherein the structure consists of a thin shell of wood, metal or other material, supported by ribs, frames, belt frames or bulkheads, but usually without longitudinal members other than the shell itself. The whole is so disposed as to carry the stresses to which the structure is subjected.

145. **GAP.** The distance between the planes of the chords of any two adjacent wings, measured along a line perpendicular to the chord of the upper wing at any designated point of its leading edge.

146. **GEAR, FLOATATION.** See *Floatation Gear.*

147. **GLIDE.** A gradual descent without engine power sufficient for level flight. Also used as a verb.

148. **GLIDER.** A light motionless form of aircraft similar to an airplane. One who glides.

149. **GLIDING ANGLE.** See *Angle, Gliding.*

150. **GROUND ANGLE.** See *Angle, Ground.*

151. **GROUND SPEED.** See *Speed, Ground.*

152. **GUY.** A rope, wire or chain which is stretched between two objects. Used to add strength or stability.

Aviation Advisory Board

Conducted by
CHARLES HAMPSON GRANT
Chairman of the Board
Formerly of
The Technical Section, Air Service, U. S. Army

MODEL builders seem to be as inquisitive as ever. This is a very commendable quality as it leads to infinite knowledge. Many questions have come to us this month; in fact, more than we can answer here. If you do not see your questions answered here or do not receive a letter concerning them, do not be disappointed. Eventually you will have some word concerning your questions.

Here is a question from Private Jerome D. Berry of "B" Battery, 16th Field Artillery, Fort Hyle, Maryland:

Question: What system or formula did Anthony H. G. Fokker use to design the airfoil actions on the Fokker D-7?

Answer: It is not known definitely what system he used. However, he probably followed a system common to many designers. First he probably did research and determined the effects and actions of various types of airfoils. Then, with a little judgment gleaned from his experiences thrown into the problem, he sat down and worked out an airfoil that he thought was a good one. Undoubtedly, this airfoil was made and tested along with others of similar design. The best for his particular purpose was chosen.

Frank C. Powers of 5 Meadow Street, Salem, Mass., asks us some exceedingly interesting questions concerning the design of a light plane which he contemplates building.

Question: If a small motor about fifteen to twenty horse-power was added to a light plane on the lines of a glider, would the moment arm have to be increased or would there be sufficient stability by just enlarging the area of the empennage group?

Answer: Strange as it may seem, the tail surfaces of the glider could be made much smaller if an engine were added to the plane, or when increasing the weight of the airplane near the center of gravity in any other way. The reason for this is that the total weight of the airplane would be increased by adding the engine and, therefore, the plane would fly faster. This fact would make the tail surfaces more effective as stabilizing elements.

Question: Is there any advantage in having two small fins instead of one large one? I have noticed this arrangement on some of the latest transports. The "Electra" is one of them.

Answer: Yes. There is an advantage in this type of construction. When two small fins are used the two fins may be made much lighter than one, which would have the same area. This is due to the fact that the surface which receives pressure while in flight is not very remote from the points of support, therefore the breaking and bending moments are much less. There is also the possibility that when two fins are used, located a considerable distance out from the body of the plane, that they are more effective because they are located in a steadier air flow. The wash from the fuselage or body at stalling angles often affects a fin placed directly above it.

Question: What would be a better airfoil to use; those that are best for soaring or the popular M-6?

Answer: The type of airfoil that you should use depends entirely upon the performance that you wish the plane to give. If you wish the plane to have soaring qualities with a sacrifice of speed, the soaring airfoil should be used. The M-6 should be used if speed is desired.

Question: How is the center of gravity measured on a pusher, such as the Curtiss Wright Junior? Is the datum line drawn at the nose of the ship like on the tractor type, and moment arms figured from there?

Answer: The same system is used on the pusher type of ship regardless of the position of the propeller and engine.

Question: In this question Powers wants to know why he can't have more designs of planes in UNIVERSAL MODEL AIRPLANE NEWS by Mr. Grant.

Answer: The editor greatly appreciates this evident compliment and refers the reader to the article on "The Fundamentals of Model Airplane Building." In this series of articles designs of all types of planes will be given, gradually working up from the simplest ones to extremely complicated ones. Each month more difficult operations will be taken up. We suggest that the reader build the plane which appears in this issue. It is an all-balsa plane, but will give a performance equal to most contest models.

Question: Is dihedral necessary on a tapered wing? Gliders do not use it and transports do. Is speed a governing factor in this case?

Answer: Dihedral is necessary on any wing, except swept-back wings, if a par-

(Continued on page 48)

The new fifteen passenger Bellanca Seaplane. A 715 h.p. Wright Cyclone engine drives it at 160 m.p.h. maximum or at 145 m.p.h. cruising speed. The arrangement of the twin floats is unique and allows the ship to be converted quickly into a land plane. The plane may also be equipped with amphibian gear, the wheels folding up into the stub wings. Outboard motors may be attached to the floats for taxiing when close to shore

ANOTHER HONOR FOR IDEAL SUPER DETAIL PLANES

TESTED & APPROVED BY JUNIOR BIRDMEN OF AMERICA MODEL PLANE INSTITUTE SER. NO. ONE


JUNIOR BIRDMEN OF AMERICA
NATIONAL HEADQUARTERS—1834 BROADWAY
NEW YORK CITY

July 31st, 1934

Mr. David Newark, Vice President,
Ideal Aeroplane & Supply Co., Inc.,
20-24 West 19th Street,
New York City.

Dear Mr. Newark:

Through Mr. Irwin Polk, Supervisor of our Ideal Aeroplane Model Plane Institute, I am pleased to learn that your Stinson model is the first to be approved by this organization and I am most happy to pass this information on to you.

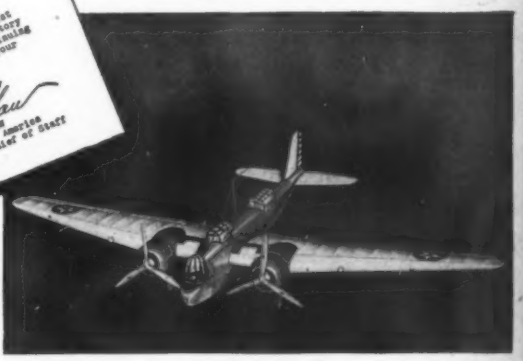
The Junior Birdmen Seal of Approval, bearing serial No. 1, is being sent you for use on the carton, instruction sheets, etc. of the Stinson model.

This model has been found to be almost 100% perfect as a result of our various inspectors and field tests, and I feel sure you are continuing this splendid effort in the construction of your other kits and aviation products.

Very truly yours,
Lawrence Shaw
LAWRENCE SHAW
Junior Birdmen of America
National Director & Chief of Staff

First to be Approved

...by Junior Birdmen

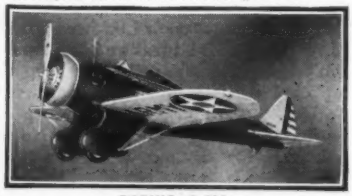


STINSON RELIANT

Wingspan 32 5/16", length 21¼", weight 3½ oz., exact ¾" scale. Here's a plane you'll be mighty proud to own and fly. An exact reproduction of one of the latest 4 passenger cabin planes. You'll find more unusual and different features in this plane than in any other. For example—adjustable speed arresters built into the wings, the movable cabin doors, the complete interior with four seats and control column, and all the other Super-Detail features. Colored in bright contrasting yellow and black.
Kit complete **$2.50**

CURTISS GOSHAWK

Wingspan 23⅝", length 16¾", weight 3⅝ oz., exact ¾" scale. You've heard of this beautiful Curtiss Goshawk. Now you can build your own with the most complete kit you ever saw. This snappy little Navy fighter has many more details than you can see in the photo. Everything designed in exact scale of course. Streamlined drag ring specially designed; two detachable blade propellers, and the entire model coated with the new IDEAL high lustre finish, with silver, yellow, red and black coloring. Plenty of material is furnished.
Kit complete **$2.00**



BOEING P-26A

Wingspan 21¼", length 18", weight 2½ oz. Exact ¾" scale. One of the newest, most advanced of all fighting planes. Fast, speedy, with full armament capable of over 240 miles per hour. This flying model is an exact replica of the famous fighter—one that is identical in all but size with its noteworthy big brother. Beautifully colored in olive drab and yellow. All Super-Detail parts included.
Kit complete **$1.75**

New Super-Detail Martin Bomber

Exact ½" Scale

Wing span 34¼", length 22⅛", weight 4⅝ oz. This famous big, powerful mystery ship of the Army now comes to you in exact ½" scale, a beautifully designed olive drab and yellow **IDEAL** Super-Detail Model. Has more new and beautiful features than any model plane you ever saw—one of the most complete flying models ever built. In addition to cockpit-operated controls and other standard Super-Detail features, the MARTIN BOMBER has retractable landing gear, rotating gun turret, movable machine guns, special streamline cowlings, two types of 3 bladed propellers—one for flying and one for exhibition; with removable motor sticks for flying; Rudder and elevator balanced surfaces. New type freese ailerons—all in all one of the finest flying models ever built. Order yours today with the coupon.. KIT COMPLETE..... **$3.50**

First to be approved—found to be almost 100% perfect in every detail—the famous IDEAL Stinson Reliant. This big beautiful flying model came away with the honors—and that's the way every IDEAL Super-Detail model is built, to come out on top.

No wonder IDEAL models take the lead. They are 100% scale—laid out by experienced flying men—men who have spent their lives designing and building real planes. That's why IDEAL Kits are accurate, complete, perfect, exact in every detail. That's why you really learn the principles of aviation when you build and fly an IDEAL Super-Detail model.

Whether you build the New Martin bomber shown above, the Stinson Reliant, the Curtiss Goshawk or the Boeing, you get the same high quality workmanship, the same accuracy in detail and 100% scale reproduction with every construction feature of the original duplicated and in the exact proportion, so that the finished plane not only flies beautifully, but it gives you a strikingly handsome, precise and perfect flying model.

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There is a big demand for IDEAL Model Planes. They are extremely popular for decorative purposes in the home. Sporting goods stores dealing in aviation supplies, drug stores, jewelry stores, and toy stores all want them for display purposes and to place in stock. They are beautiful in windows or on counters, they help to advertise the store and attract attention to the windows.

You can sell finished IDEAL Planes to gas stations dealing in aviation oils; rent or sell them to department stores for special sale or sales in the sporting goods departments. You can also rent or sell them for decorative purposes to aviation associations, lodges, and club rooms. The possibilities for selling finished planes are almost endless.

FREE FOLDER —Send also for the new IDEAL folder showing the latest model IDEAL Planes. It contains valuable information on how you can make real money by building and selling these famous flying models.

DEALERS: You can make more money with IDEAL products. Write for details of more than 100 model airplanes & ship models

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WHAT THE SUPER-DETAIL KIT INCLUDES:

Everything necessary to build a big, beautiful workmanlike job is included in the Super-Detail Kit. Finest materials only are used in its construction: Sheets of selected plainly printed balsa, strips of various sizes, etc., sheets of silk tissues, cement, both colored and plain dope, propeller shafts, two propellers, motor plate, rubber motor, wheels, cable cord and all other hooks, pulleys, control hinges, eyelets, washers, sand paper, celluloid, reed, wire and other small but necessary things to make the complete model exactly in accordance with the plans and instructions.

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Please send immediately the items I have checked below. I am enclosing $..... (West of Denver 25c extra. All planes postpaid.)

Martin Bomber ☐ $3.50 Curtiss Goshawk ☐ $2.00
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Please print name.....
Address .....
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Fundamentals of Model Airplane Building

(Continued from page 7)

tapered in toward the center of the wing at its tips an equal distance. Each half requires four ribs, which are shown in the plans under "Ribs" as Nos. 1, 2, 3 and 4. Cut the halves to shape, cement the ribs in their proper positions and hold with model pins until dry. The two halves are then cemented together at a 2¼" dihedral for each wing tip. A small fin is attached to the center-top of the wing to lend stability. This is shown in the plans under "Fin." Note that it is cut to shape from 1/16" sheet balsa and that its bottom edge must be shaped to fit the curvature of the wing made by the rib No. 1. When completed, cement this fin over the joint formed by the two halves.

Wing clips are bent from No. 6 piano wire, as shown in the plans under "Wing Clip." These are the same construction as those of the elevator and are held in place on the stick as described in the October issue. (See October issue, Pages 9 and 11, Figs. 3 and 1).

Propeller

Mr. Grant has elected to use a left hand propeller on this pusher model. Usually when only one propeller is used on a model, it is a right hand propeller. This means that the propeller turns clockwise when viewed from the rear or concave side of the blades. In other words, it is wound in a counter-clockwise direction and when released, it travels in the same direction the hands of a clock turn.

When a propeller turns counter-clockwise, when viewed from the rear or concave side of its blades, it is known as a left hand propeller. In other words, it is wound in the same direction as that in which the hands of a clock turn, but when released, it travels in the opposite direction to those of a clock.

This explains the left and right hand propeller, but has nothing to do with a pusher or tractor propeller. As far as the actual propeller is concerned, there is no difference whatever between a pusher and tractor. Both are carved in exactly the same way. Both are mounted with the concave side of the blades trailing. In other words, when viewing the propeller from behind the model, you will always see the concave sides of the blades.

The only difference between a tractor and pusher propeller is that the hook of the propeller shaft extends out from the hub of the propeller on different sides. The shaft of a tractor propeller extends out from the hub on the concave side of the blades. The shaft of a pusher propeller extends out from the hub on the opposite or convex side of the blades. A tractor propeller can be changed into a pusher propeller by simply changing the propeller shaft so that the hook of the shaft is on the other side.

The carving of a left hand propeller is not a necessity for this model. A right hand propeller will serve quite as well if the shaft is inserted from the opposite side. However, a left hand propeller should be carved for this model, in order to be able to wind it by hand clockwise the same as right hand tractor propeller is wound clockwise.

The carving of such a propeller is exactly opposite to that of a right hand propeller. This is shown in the illustration Fig. 1, which shows the start of carving one. The first cuts are made along the left top edge of the blank, as shown at "A," while a right hand propeller would be started at the right top edge, as shown at "B." All actual carving steps are the same, after the blades have once been started as at "A."

Bend a propeller shaft from No. 13 piano wire and insert it as you would a right hand propeller so that the hook is on the concave side, and the job is finished.

Assembly

Study the plan under "Side View." Bend an "S" hook from No. 13 piano wire. Six strands of ⅛" flat rubber are used for the motor. Obtain a piece about twelve feet long, tie its ends together and loop it into six strands between the "S" hook at the end having the nose hook and the hook of the propeller shaft. The clips of the elevator and wing are then placed around the stick and held with rubber bands, as explained in the last article in the October issue. Place both these surfaces exactly as shown in the plans.

Hand wind the motor for trial flights and launch it as shown in the illustration Fig. 2

Slipstreams

(Continued from page 25)

to propel a plane at this speed would be impractical if not impossible.

"At first I was inclined to agree with him, but then I began to think. What about the tip of the propeller of a plane which moves through the air at an enormous speed? So I secured my pencil and compiled these facts; that is, I hope they are facts:

"The engine of the new Lockheed Orion, a P&W Wasp S1D1 turns at 2200 r.p.m. I don't know the length of the prop of this plane but I hazarded a guess of seven feet. The distance traveled by the tip of the prop in one revolution is 11x7 feet or 22 feet. The distance traveled in one minute is r.p.m. x the circumference; so the distance traveled in one minute is 48,400 feet, which equals 9 1/5 miles per minute. Thus, approximately the speed of the tip of the prop is 540 m.p.h.

"I took for granted that the prop doesn't heat, at least I have never heard of one doing so."

We believe that Mr. Tighe has handled this situation very well in his analysis. Do you think what he says about the motor is true? Perhaps you may see some interesting points about this problem which Mr. Tighe has not mentioned; if so, let us hear what you think.

We wish to extend our appreciation to Mr. Norman Barker for his contribution of the excellent drawings appearing at the beginning and end of this section of the magazine.

"I have inspected many C-D planes and have at last concluded that you excel in detail and construction. The models also have fine flying characteristics. I enclose this Boeing order with a feeling of complete satisfaction before I receive your Kit because of the statements above."

States a New York customer because C-D's are the Standard of Comparison.

Redesigned '17 FOKKER D-7

Our well known D-7 model has been re-designed into this authentic steady flying beauty and so beautifully colored that it looks as though it was drawn right from the ranks of one of the famous German "Flying Circuses". Wings taper beautifully, new feature control movements (not from cockpit), scale propeller, authentic spandau guns, pilot block (you make all)—and printed out wood. Very beautifully colored international orange, green, white, black details. Span. 21½", length 17⅛", wt. 3.5 oz. Kit No. SF-15B complete, postfree $2.50

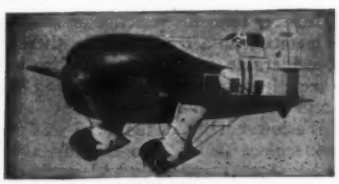
Latest ARMY MARTIN BOMBER

Another C-D realistic masterpiece! An authentic highspeed flying model of the famous mid-wing bomber—the plane that's still on the secret list—claimed fastest service bomber in world—Army again ordered 46—10 used in U. S. to Alaska cross-country trials, called one of the most difficult and hazardous flying trips ever undertaken—only a Martin could be entrusted to do job—the only really efficient substitute mail plane. Span 53", length 33¼", weight 17 oz. Colored standard U. S. Army yellow, olive drab, details black. Novel and strong method of duplicating an almost impossible landing gear (but not retractable). Complicated fillets beautifully (and easily) duplicated. Nothing ever before like it—even our Boeing 247. Has printed-out wood—an enormous quantity—all strips necessary. Turned Balsa invisible hub wheels. By simply removing motor spars (the time-proven efficient method of multi-motor powering) model is ready for exhibition. All other necessary material, such as strong tissue, celluloid hinge wire, M.W., large quantities of dopes, wood and paper cement, insignia, rubber, turned cowl fronts, stout axle material, stripping tape, etc., hundreds of pieces considering all wood printed out. If sold 5 or more years ago, would easily command at least $20.00. Shipped express collect. 10 lbs. (not C.O.D.)—ready for shipment approximately Sept. 25th—order yours now! Complete (Giant) Kit SF-45, only $6.50

Approx. 10 lb. charges to N.Y.C. 58c; to West Coast $1.40. Incidentally no kit price shall be lowered: If any change takes place, it will be an increase. Order now!

Authentic '32 HOWARD "IKE"

Information on this design is supplied both as the four or two wheel "Ike," and the two wheeled "Mike." The model flies and climbs beautifully at a fair rate of speed—in practically the same manner as our older well known "Pete." The model has a span of 15⅝", has a length of 13⅛" and weighs 1.5 ozs. Colored entirely white with black details, lettering. Complete 196 piece printed wood Kit SF-42 Postfree only.... 98c



'32 Gee-Bee

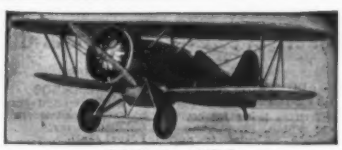
Doolittle's supersporter. Span 18½", length 13⅜", weight 2.7 oz. White with red scalloping, black details. **NOW CONTAINS PRINTED OUT WOOD.** Complete Kit SF-27, only **$1.75**

BOEING P12-E

Span 22½", length 15⅝", weight 3.2 oz. Printed out wood. Colored yellow and olive drab, with beautiful red and yellow trimmings. Complete Kit SF-8C, only..... **$1.75**

"Prompt mailing service and quality make your Company one of the best I have ever patronized. I was thoroughly satisfied with the Kit I recently purchased."—Detroit, Mich.

"Although I have had only two of your models, a Boeing F4B-3 and a Wasp C, I am convinced that yours are the best to be had."—Youngstown, Ohio.



'33 Boeing F4B-3

Span 22¼", length 15⅜", weight 3.2 oz. Silver, yellow, red. NOW HAS PRINTED OUT WOOD. Super complete. Complete Kit SF-29 ..... **$1.75**

The pride of many C-D fans.

KING OF LARGE DISTANCE MODELS—BOEING 247. Span 55⅝", length 38½", wt. 16 oz. Colored all silver. A Super - complete Kit—119 pieces, including many 36" balsa sheets and strips, tapered "nose" pieces for wings, large special balsa wheels with bronze bushings, drilled aluminum tail wheel pieces, turned balsa end rings, C-D standard steel type slotted and drilled flying propeller hubs, all necessary dopes and liquids, over 20 sq. ft. of full size superdetailed C-D drawings and photos, and all other special material needed. Complete (Giant) Kit SF-35 (shipped "express collect" only—recipient to pay 7 lb. shipping charges when delivered)—originally sold at $6.50— now only **$4.95**

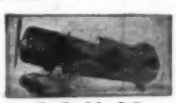
'32 Douglas O-38

Span 30", length 22⅝", wt. 4.8 oz. Yellow, olive drab, black details. Printed out wood. 2 pilots, etc. Complete Kit SF-43, only **$2.75**

A very beautiful and unusually detailed model.

'33 Aeronca C-3

Span 27", length 15¼", wt. 1.9 oz. Red and silver. Complete Kit SF-40 .. **$1.75**



'31 Bayle's G-B

Span 17⅛", length 12", wt. 2.1 oz. Yellow and black. Comp. Kit SF-17B **$1.50**

'32 Hall Racer

Speed flights. Span 19⅛", length 13⅜", wt. 2.8 oz. Red and black. Complete Kit SF-31, only **$1.50**

'30 Howard "Pete"

Span 15", length 12¼", wt. 1.5 oz. All white. Complete Kit SF-18B **98c**

Printed Out Wood in all these Kits except SF 31, 32 and 35

1930 CAPT. PAGE'S RACER

Excellent performing high speed model. Span 23⅜", length 17⅝", weight 3.5 oz. Colored silver, with red-white-blue insignia. Authentic and superdetailed. A super-Complete Kit—211 pieces, including the printed out wood parts, all supplies, special equipment, dopes and the famous C-D exact size super-detailed drawings. Complete Kit SF-44, postfree, only **$1.75**

'33 Curtiss F9C-2

Span 19¼", length 15⅛", wt. 2.2 oz. Silver, blue, red and black. Complete Kit SF-22B **$1.75**

1933 WACO C

Span 24⅜", length 19⅛", weight 3.7 oz. Silver and red. Complete Kit SF-37 ..... **$2.75**

'33 HEATH PARASOL

New printed wood kit. Span 23⅝", length 13⅜", wt. 0.8 ozs. Orange and black. Complete Kit SF-26 now only **98c**

'32 Boeing P26

Span 21¼", length 17⅜", wt. 2.5 oz. Yellow and olive drab. Complete Kit SF-23 ..... **$1.75**

All photos on this page are of our own ¾" flying models.

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'32 Supermarine S6-B

Span 22", length over all 21⅝", wt. 2.9 oz. Will R.O.W. Silver and blue. Kit SF-19, only **$1.75**

'30 Boeing 95 Mail

Span 33¼", length 24¼", wt. 3.5 oz. Blue and natural. Complete Kit SF-32, only **$1.50**

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The Development of the Fokker Fighters

(Continued from page 17)

the true trailing edge which was reenforced for eight ribs from the wing tips, the length of the aileron. Hinges were fitted to the wing tip rib and to the eighth rib with a third hinge bearing on an internal compression tube located between the fourth and fifth ribs from the wing tip. The lower wing of one piece construction, fitted into a recess in the bottom of the fuselage and consisted of two spars on which were mounted 26 full ribs, 13 ribs in each panel. The bolt and plate method of fastening the lower wing to the fuselage was the same as used on the V.9.

Two sets of right and left center section struts held the upper wing high off the fuselage. The forward set on each side consisted of three steel struts arranged in pyramid form with the center and longest member extending from the upper wing spar fitting to the ball and socket joint on the lower longeron. The foremost of the trio fastened to the engine bearer through an opening in the side cowling, while the rear member led backward to the upper longeron, and to a fuselage upright which continued to the lower longeron at the same angle. The second or rear set of struts consisted of one member of streamlined steel tubing running from a fitting on the rear spar to a fitting on a fuselage upright at a point two inches above the lower wing.

It is interesting to know that this identical wing arrangement and almost identical dimensions, were repeated a whole year later in the design of the Fokker D.VII, although at the time of its construction, the V.11 was looked upon with scorn by those not convinced of the practicability of the arrangement. Having to be content with sitting back and waiting for necessity to demand the use of his too-advanced aeroplanes, Fokker modified the V.9 type into a high altitude fighter known as the V.13, a typical example of Fokker's experimental genius brought into being.

From outward appearances, the Fokker V.13 would impress one as being a mighty good plane to avoid in combat, and this was no doubt actually true to a certain degree, although it never saw actual service at the Front. In the hands of an experienced pilot, aware of its odd and unconventional behavior, this ship would have been an asset. But time was too valuable to spend in training and educating Front pilots to its faults. Too, there was still the effective bleating of the competitive aircraft manufacturers about Fokker's status as an alien in Germany, allegations of his shipping of profits to Holland, and a hundred other minor but only natural conditions magnified for the suspecting Imperial eye. Consequently, the V.13 like many other of Fokker's products, was no doubt greatly admired individually, but officially they were all "too advanced for practical use," or, "our pilots would not have confidence in a machine without wires to hold the wings."

Fokker no doubt realized that his new product, the V.13 and perhaps others to come, would not be accepted, but he also knew that if he kept up his progress, that he would some day produce a plane so fine that it would overcome any and all objections. This he did, not once but twice.

When finally completed at Schwerin, the site of the Fokker factory, the V.13 provoked many comments on its sleek and beautiful lines. The fuselage was again of the triplane type but with certain structural variations to adopt it to a biplane arrangement. Much smaller in area and dimensions than on previous models of the type, the upper wing of the V.13 contained only 26 ribs mounted on its two spars. The usual Fokker balanced ailerons of the long, narrow type, the most efficient kind, were used in the upper wing only, and were actuated by cables from the cockpit. The ailerons were built into the wing with their trailing edge flush with the trailing edge of the wing. Although this arrangement was considerably more effective and much safer than the practice of attaching the members to a trailing edge, there was a considerable addition in labor to build up the ailerons to carry out the wing curve and to affix the aileron spar.

The lower wing in the V.13 was made of one piece fastened to the fuselage by the usual spar channels and under-plate covering. Eleven ribs in each side panel and the two spars made up the framework. The scalloped trailing edge was

(Continued on page 40)

Mystery Ships of the Sky

(Continued from page 5)

nautics has issued a set of specifications for a new ship and three companies so far have built airplanes along these designs. The design calls for a two-seater amphibian biplane, the wings to be able to fold.

Vought has built a new type ship known as the Vought XO5U-1; Curtiss has built the XO3C-1, and Douglas has built the XO2D1. The Douglas crashed during her tests due to faulty landing gear, but has since been rebuilt and is again at the Station undergoing tests.

It may be possible that a fourth ship has entered the competition in this line of planes, with Berliner Joyce (B/J) submitting their amphibian which is known as the B/J XOJ-3 and is of a somewhat similar appearance to the other three mentioned. Probably no actual figures will be available on these airplanes for another year, but the average speed for these airplanes should be about 160 m.p.h. cruising.

Of the three or possibly four, the Douglas seems to have a slight edge in speed over the others, although they are all good "performers." Another important factor concerning these planes is that they all have "slots" and flaps to reduce the landing speed.

As many of us know, the Navy has a standard type of designation and by looking at the number on the rudder of an airplane, we can tell what tactical use the plane is for, the model design, manufacture and the modifications. In other words, if we see the letters "F4B-1," we know the plane is a fighter of the fourth design, built by Boeing, and has no modifications. If it is the "F4B-2," we would know it has had one modification.

The Navy has accepted a few new types of airplanes now however, with a special tactical use or duty to perform. On these new airplanes, a new type of designation is employed. Take the case of the new Vought which has been designated for scouting and also bombing. Its designation contains both the scout and bombing letters. It is known as the Vought XSBU-1. In other words a "Scout-Bomber" is one of the very latest types of designs. In this new designation there is also a "Bomber-Fighter." The old Curtiss XF11C-1 "Goshawk" has been changed into the Curtiss XBFC-1 and is to be used exclusively for bombing and fighting purposes. Boeing has a model in this class also. They built the XF6B-1 which did not come up to a full "Fighter" standard in the Navy, so they redesigned it for bombing also. It is quite a heavy ship, and was rejected as a fighter because it was not fast enough. Possibly it will serve its purpose better in its new capacity, but this is yet to be determined.

Grumman airplanes seem to have made a huge success in the Navy. Their two-seater "FF-1" fighter is a good, sturdy and dependable job. It is staunchly yet simply constructed and has a high speed for an airplane of its type. Due to the wide gap between its upper and lower wing, it is also a very stable flyer and most of the men who have flown in this type of airplane, have the highest praise for it. The Grumman people have also built recently a single-seater fighter which will undoubtedly be accepted by the Navy, if it hasn't already. This ship is one of the best fighters that the Navy has tested. Its stunting ability and also high speed is enough to pass the test and make it quite outstanding in its class. Also, as in the rest of Grumman airplanes, it is strong and can "take it."

The XJF-1 Grumman amphibian has been accepted and rumor has it that a number of them will be ordered for the Coast Guard Service. The amphibian is a two-seater job and it is somewhat like a Loening OL-9 model cleaned up. Mr. Grumman himself used to work for Loening and possibly the OL-9 was also designed by him. At any rate, the new Grumman amphibian has a great many new features which will make it popular with the men who fly it.

Berliner Joyce (B/J) has not been as fortunate with their experimental models as Grumman. The B/J XFJ-2 was very fast on its landings and was quite tricky to handle. Next they built the XF2J-1, a two-seater job designed as a fighter. According to reports on it, it was too slow or else there were some defects in it, as nothing much was ever done concerning this plane. Their latest model the B/J XF3J-1 is again a single-seater fighter with a peculiar "butterfly" top wing. It is a biplane on which they have been experimenting with a new type engine cowl. From Navy men working on it however, comes the report that it is much slower than it should be and is in all probability

(Continued on page 42)

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5/8x1 1/4x12....2 for .13
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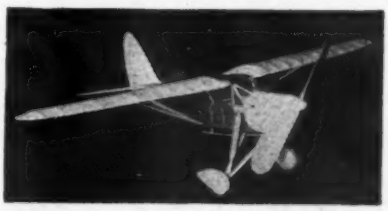

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When Air Conquers Air

(Continued from page 15)

and in keeping with the balance of the model.

The strips on the top of the fuselage over the cabin are ¼" square balsa and are beveled slightly on the top so that the wing which has considerable dihedral, will fit on more snugly.

The tail skid shown has a good spring action and also has a wheel on the end. It is made of a single length of No. 16 wire. The wheel is made of a wooden button 1" in diameter. A piece of 1/16" O. D. brass tubing is glued in the hole to make a bushing. A ready-made wheel can of course be substituted for this assembly. The wheel is slipped on the wire and the latter is bent to the correct shape on both sides. The part which is bound to the tail post of the fuselage must first be bent in a "wiggly" shape like a hairpin to give strength against side strains. When it has been put in place, a piece of ⅛" x ¼" balsa is cut to a streamline shape. This is bound on the two wires with ⅜" linen dressmaking tape and coated with dope. This assembly can be replaced by a simple skid, but, as most of the flying is done R.O.G., the tail wheel is a great help in "hands off" take offs.

The landing gear comes next. This is made of bamboo, streamlined with balsa. The vees are made in two pieces each and bound together at the bottom. The top ends must be bent over a flame so that a firm connection with the fuselage can be made at this point. The cross section of the bamboo is about ¼" from front to back and of a triangular shape with the wide part at the rear. The four strips are all of equal cross section. They are later streamlined with balsa, taped on with ⅜" linen tape and doped. This construction is light but strong and looks much sturdier than it would if the balsa were not added. The two pieces of each vee are bound together first, then the whole thing is bound to the fuselage. Plenty of glue may be used here to get the very necessary strength. When this joint is set, but not completely dry, the vees can be carefully bent to the proper angle and blocked or tied there to dry.

The next step is to fasten the wires A—A' in place. These are of No. 16 wire and serve as an additional brace against sidesway in the landing gear. Each wire runs from the junction of the fuselage and front strut on one side, down to the tip of the opposite vee. They are bound and glued in place.

The balsa streamlining mentioned before is now put on. Cut and sand the piece to shape, then wrap it on with the ⅜" tape, using plenty of dope in the process. Overlap each turn slightly, but put on only one layer. Give several coats of dope after it is finished.

The final pieces of the landing gear are the bamboo struts B—B'. These are of ¼" x 1/16" bamboo and are rounded to a fair streamline shape. Do not take off too much material, however, as these struts take most of the landing shock. When they have been cut and smoothed to shape, they are bound at one end to the strip C which is of brass and of ¼" x 1/64" cross section. At the lower ends, the axles are bound in place. These are of 1/16" music wire.

When the unit is complete, it can be put in place on the bottom of the fuselage, as shown. It is fastened only at the top, by binding the brass strip C to the cross piece. The lower ends are fastened to the vees with wrappings of 1/16" square rubber. The necessary amount must be found by experiment, so it is best to wait until the model is complete before doing the wrapping. Too much rubber will make the shock absorbing action too stiff, while too little will allow the vee to dig into the ground on landing, which of course will turn the model over on its back. Also, it is better to use more turns loosely wrapped than a few very tightly pulled, as the shock action is better.

The wheels may be of any type that is strong enough. Solid turned wheels of the airwheel type are preferable, but were not obtainable when this model was built, so the 3¼" celluloid ones were substituted. These are not very strong, however, and have broken several times, so it would be best to turn out on a lathe or build up a pair of hard balsa or white pine wheels.

The tail assembly is taken in hand next. Lay it out completely and to full size before starting assembly. The rear spar of the stabilizer is ¼" x ⅛" and since it is set on edge, it must be tapered at each end to ⅛", starting about 2" back from the ends. The curved leading edge is of ⅛" square balsa and *must* be soaked in water and bent to shape before assembly. If it is not, the stabilizer is sure to warp. After the balsa ribs are cut to the size and shape shown, the whole thing can be assembled.

The two saddle pieces, D and E, are of wire and serve to hold the stabilizer in place when rubber bands are run from one hook under the fuselage and up to the other.

Right here it may be noted that the stabilizer and fin can be rigidly fastened to the tail if so desired, but in a model of this size, it is a great help to be able to disassemble it completely.

A two inch length of flexible brass wire of about No. 24 gauge is wrapped and glued to the middle of the leading edge, this wire being used to hold the front of the fin in place.

The two elevators are fastened and built up on a ¼" x ⅛" strip of balsa, which is a duplicate of the rear stabilizer spar. There is nothing out of the ordinary about the elevators, the curved parts being carved from ⅛" flat balsa and the bracing is put in as shown in the plans.

When the elevators and stabilizer are completely dry, we are ready to hinge them

(Continued on page 44)

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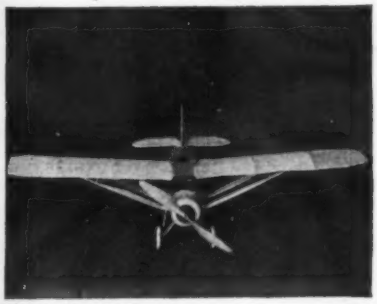

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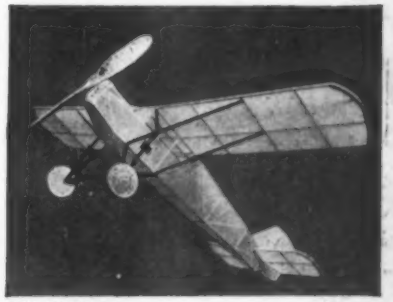

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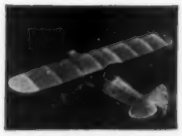

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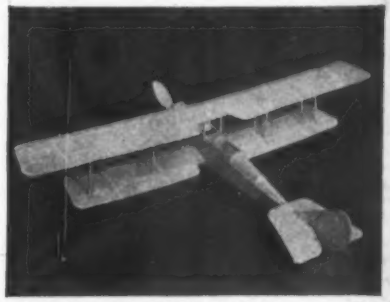

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The Development of the Fokker Fighters

(Continued from page 34)

formed of steel wire with the actual supporting trailing edge located inward about three inches. Internal wire bracing was terminated at fittings attached to two compression members in each wing panel.

In the V.13, the gap between the planes was lessened considerably by utilizing short center section struts which brought the upper wing down over the body like a parasol monoplane. If the reader will cover up the lower wing of the illustration, (Figure 3), he will notice a remarkable resemblance to the D.VIII Fokker. This is again an emphasis of the fact that Fokker's planes were always variations of one another and only in a few cases radical departures.

The front set of struts have their upper terminal plates fitted into the front wing spar. The bolt and plate fitting used here allows the alterations of incidence in the upper plane, presumably to provide a quick climbing ship, or if so desired, a fast one. The two short streamlined struts were spread apart at their bases and welded to the upper longeron. The long front member projected from the spar fitting to the lower terminal of the engine bearing plate and the lower longeron. The rear center section struts are single and extend from the rear spar fitting to an interior bracing member in the fuselage.

Interplane struts are of the Fokker "N" type, made into a single unit of streamlined steel tubing. Spars in the upper and lower wings, aided by internal compression members carry the necessary fittings.

Perhaps the most startling feature of the V.13 is the long crane-like landing gear. Each alighting "V" is welded into one piece with the base extremities joined to the bearing plate and lower longeron. Slides were welded into the apex of each "V" to allow approximately four inches of axle travel on landing. Rubber cord took up the shock. Steel wires braced the front pair of struts only.

The cause for this long landing gear is most interesting in that Fokker in 1916 used the method of getting speed and propeller efficiency that engineers have employed in recent years to obtain the same results in modern racing planes. Two requisites for speed are a high pitched propeller and a low turning motor. Figure 3 shows clearly the long, high pitched "paddle" and technical data shows that a governor was used on the motor to slow its revolutions. Presumably to aid in the efficiency of the propeller, the landing gear wing was omitted in the V.13.

Probably no other aeroplane designer has paid so much personal attention to his products as has Fokker. It was and still is his custom to test his own craft personally. After the test flights, Fokker can tell just what is ailing this or that tendency and can remedy it effectively because he is more familiar with the design than any of his helpers.

Figure 5 shows Fokker seated in one of his early monoplanes ready to make such a test flight. He didn't leave the plane until the difficulty was solved, or the design was discarded. For the young man meeting his first problems in the world today, Fokker's perserverance, sincerity and honesty makes him a man to model. His success is due to effort, foresight and that most useful of all gifts, good common sense.

Part Twelve of this series will present two of Fokker's monoplanes which would be up-to-the-minute if built today, and that fabulous, most unheard of accepted Fokker, the D.VI.

The Aerodynamic Design of the Model Plane

(Continued from page 23)

denied that other samples of different quality may give different results.

Now, suppose we consider the amount of *work* that can be absorbed by these two kinds of rubber. As it was stated in the preceding article, the amount of work that can be stored in a rubber motor is equal to the produce of the *average torque* times the *maximum* number of turns. The average torque equals approximately *one-half* maximum torque given in the tables (September issue, page 23) and shown on the graphs (October issue, pages 28 and 29).

In *graphs* No. 1 and No. 2, it can be readily seen that the area under the curves, which represents the amount of work it is possible to store in a motor, is greater for black rubber than for brown rubber in case of various number of strands.

By taking half the maximum torque as given in tables No. 1 and No. 2, and multiplying it by the corresponding maximum number of turns it is possible to store in any particular motor, we find that the work it is possible to store in motors of black rubber, is greater in every case.

In tables No. 5 and No. 6, where lubricant is used, we find that in some cases of various numbers of strands, that brown rubber shows a greater work storage capacity, and in others the black rubber appears superior. On the whole, taking possible variations from the normal that are bound to develop in all tests of this character, the two types of rubber show about equal capacity. Considering the two types, ounce for ounce of weight, however, black rubber shows an advantage of about 15%.

There is another important point to consider now and that is the effect of the size of the strands composing the motor upon the maximum torque, and the work possible to store in the motor. Tables No. 3 and No. 4 show values for rubber of the same thickness (1/32") but of different widths. Table No. 3 is for rubber 1/16" wide and table No. 4 is for 1/32" wide rubber, just one-half the cross section area of the 1/32" x 1/16" rubber.

If we consider the maximum turn values for motors of these two sizes of rubber with equal cross section area, we find that more turns can be stored in the motor composed of the larger strands. For instance, comparing the value shown for *twelve* strands of 1/32" x 1/32" rubber with values for *six* strands of 1/16" x 1/32" rubber, it can be seen that the finer rubber will take fewer turns. This holds true in every case of various cross section areas of motors. However, the difference is not so pronounced when lubricant is used, as

shown in tables No. 5 and No. 6, except where only a small number of strands are used. In this case, more turns can be stored in the *larger* rubber. With 12 strands of 1/32" x 1/32" and six strands of 1/16" x 1/32", more turns can be stored in the motor composed of *small* size strands.

The torque developed by equal cross section areas composed of these two sizes of strands, is greater in almost every case when the smaller 1/32" x 1/32" rubber is used, whether or not a lubricant is used. The difference is considerable in most of them, amounting to about 20%.

Thus, it is also obvious that a *greater amount of work* can be stored in motors composed of small strands with few exceptions. These exceptions occur with *motors* composed of few strands. In such cases, motors composed of large strands are superior. This is illustrated by the values given for twelve strands of of 1/16" x 1/32" rubber and four strands of 1/32" x 1/32" rubber. Where many strands are used, the fine rubber is decidedly better. This can be seen from the values given in the tables for two strands 1/32" x 1/32" and six strands of 1/16" x 1/32" rubber.

Next month, more valuable information will be given about rubber motors.

Build and Fly this Bristol Fighter

(Continued from page 21)

rubber (.045 sq.). One loop of this rubber flies this model in fine style.

Before this model will fly, it needs to be ballasted with about 3/16 oz. of metal so that it balances at a point about 2½" from the nose.

Detailing

You are now ready to add a few details to your model to add to its realism. Dope 1" red, white and blue circles, the colors reading from the inside out, onto the fuselage sides and dope 2" circles to the tops and bottoms of the wings. Wing skids and exhausts are shown in the plans and these can be made from round reed and balsa. Lewis guns and squadron numerals add realism. Touch up the radiator and tires in black and wheel centers in silver, and the job's about done.

The original model weighed, in full flying condition, exactly half an ounce. Any weight up to about ¾ oz. will be satisfactory, however.

A word about the color scheme; be sure that you color all of the fuselage back of the sloping longeron piece which runs in the plans from the front of the gunner's ring to the bottom of the front center section strut, and from there down to the bottom longeron a different color from the rest of the fuselage. That line represents on a real Bristol, the dividing line between metal cowling and fabric covering. A white cowling, red fuselage, red fin, white stabilizer and natural wings makes a fine-looking model.

Flying

After the model balances properly, glide it, controlling it with elevators only. When it makes a steady flat glide, try power. The model flies fast and very stable and it will cover an honest 125 feet every time . . . often it has flown over 200 feet.

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Mystery Ships of the Sky

(Continued from page 36)

outclassed by the Northrop XFT-1, the Curtiss XF13-C-1, possibly the Grumman XF2F-1 and the Boeing XF7B-1, all of which are late type fighters. The B/J OJ-1 and OJ-2 seem to be only B/J ships in Naval service to date. However, their new amphibian may be of the type needed and if so we may see another B/J added to the regular service of the Navy.

A new ship that will surprise many is the new Bellanca Scout for the Navy. It is a high-wing monoplane scout of new design. The rear of the cabin is cut away for a gunner and the airplane looks like a scrapper all the way through. It took quite a while for this particular airplane to put in an appearance at the Air Station, as the original model, the Bellanca XSE-1, crashed at the Bellanca factory while undergoing a final "workout" before being turned over to the Navy for testing. The ship was rebuilt with a number of changes and is known at present as the XSE-2. Bellanca seems to be going in strong now for Naval and military aircraft and they are coming right along.

Recently the Navy received a Curtiss "Condor" R4C-1 to be used as a transport. One of the engines was considerably "pesky" and had to be removed twice, but is now in good condition. With the new type cowlings which are somewhat similar to the one mentioned on the B/J XF3J-1, she is quite fast, making almost 200 m.p.h., which is speedy for passenger transport.

Dive bombing is what the Navy is really working with and a great many ships have been built for this purpose. Great Lakes has built a model known as the XBG-1 which is quite a capable airplane, carries a large load and still is fast. Consolidated has also built a model of this type known as the XB2Y-1, but is generally regarded as not in competition as it does not come up to standard; although the Consolidated people usually have dependable airplanes, as can be witnessed by the old training model, the NY-1 and the rest of this series which is one of the finest trainers that the Navy has ever had. What they are working on now in connection with military airplanes, is still in doubt as we go to press.

Voughts have a new cowling which is mounted on the fuselage alongside the cockpit. When this is lifted or removed, one has free access to the instrument board from either side and also makes it simple to get at the harder spots in order to repair or make changes. This is really a big help as one does not have to all but take the ship apart in order to connect some wires to the dashboard.

There are many other airplanes along the line mentioned, and possibly we can tell you about them later on. In the meantime, the Navy is still going forward with long strides and her equipment is becoming better every day. It is a sure and safe thing to say that the money expended for testing these airplanes certainly has not been wasted.

On the Frontiers of Aviation

(Continued from page 9)

The Hawk's armament is as follows:

2 ammunition boxes and supports
1 Pilot trigger mechanism
2 Ammunition counters
3 Handles-A-3 bomb release
1 Bomb charging handle
2 Gun charging handles, brackets, and cable
2 Shell and link ejection chutes
2 Browning machine-guns (Rifle cal.)
2 Trigger motors 2 Gun mounts
2 Impulse assemblies 1 Sight mount
1200 Cartridges 2 Trunnions
1 Sight-U. S. Army 2 Mounting posts

At 9,000 feet the Hawk has a high speed of 233 m.p.h. and a cruising speed of 175 m.p.h.

A twin-engined high-wing monoplane has been built under the supervision of Mr. Frederick Koolhoven for K.L.M. in Holland. Mr. Koolhoven is the Dutch designer who you may recall had proposed to build a giant hundred passenger air transport several years ago, but evidently he has given up the idea.

When the next three proposed aircraft carriers identical to the "Ranger" are completed, there will be still a greater demand for shipboard fighters than there are at present.

Imperial Airways, Ltd., of England is contemplating the building in the very near future of some large trans-Atlantic flying boats to compete against our Martin ships.

Undoubtedly most of you by this time have read about the new Curtiss-Wright amphibian designed by Capt. Frank Courtney, who flew with Roald Amundsen in the famous Dornier Wals several years ago and who is also famed as an aeronautical engineer, his latest creation being this single-engined amphibian.

For those who unfortunately are not acquainted with the ship, a brief description follows:

The plane has many features of interest. The landing gear is placed behind the center of gravity with an additional wheel in the bow of the boat hull. This diminishes the possibility of the plane ground looping, and the brakes may also be applied fully without the ship nosing over. All three wheels are retractable, the two main wheels retracting into the fuselage behind the five-passenger cabin where it will not interfere with the passengers' comfort. The front wheel may also act as a bumper in water operations and the streamlined housing projecting above the bow which encloses the landing strut of the front wheel, may also act as a convenient handhold or antenna post. When landing on ground, the plane lands normally on its two wheels and then falls forward on the third, an action similar to that of the landing of seaplanes on water.

The 365 h.p. Wright Whirlwind engine used is built 31 inches away from the prop in the leading edge of the wing. The large distance from engine to prop increases the propeller efficiency.

The first amphibian was constructed at the Edo Float Company of College Point, Long Island, N. Y., but the Curtiss Wright

Airplane Company of Missouri will produce the future Courtney amphibians.

The ship's performance is as follows:
Top speed—151 m.p.h.
Cruising speed—125 m.p.h.
Cruising range—550 miles
Rate of climb at sea level—835 ft. min.
Service ceiling—14,000 feet.
Absolute ceiling—16,200 feet.

On a visit to Capt. Courtney, he told me that the elevators would be balanced at the tips, which is probably the only change that has to be made in the design since recent flight tests.

The first Vought Corsair mail plane for Deutsche Luft Hansa has been completed. It is a seaplane of V-80 design. Its cockpit is completely enclosed, the enclosure fairing into the rear of fuselage. (See U.M.A.N., January).

Build a Solid Scale Model of the Curtiss Hawk Type III

Plans Page 10

White pine or balsa wood may be used in the construction. Purchase all materials first. Dimensions may be had from three-view drawing.

Make the wings first. Draw the outline of top wing on piece of wood with grain running lengthwise. Cut around the outline with small jig-saw or knife. Then taper down the wing as shown in front elevation, using a small sharp chisel. Then, using the chisel again, shape out the airfoil in the wing, referring to wing sections in lower left hand corner of plans. Sandpaper the upper wing with first coarse paper and then fine paper.

Use the same procedure for the lower wing which is made in two pieces, one for each side of fuselage. Where the lower wing sections join the fuselage there are wing fillets or fairings, which may be made as part of the wing or may be put on after the assembly of the model by the use of putty. The fillets are shown in side and top elevation of plans. The bombs for the lower wing will be made later.

Make the stabilizer-elevator pieces in the same manner as you did the wings. A razor blade may prove most useful in cutting out these two pieces. When they are thoroughly sandpapered, cut out the fin-rudder piece in a like manner.

Make the fuselage next. Draw side elevation or profile on block and saw around outline. The windshield will be made later; also siding enclosure over rear of cockpit, and the motor and cowl. Go over the newly cut top and bottom surfaces with coarse sandpaper. Then draw the top elevation on upper side of fuselage block and then chisel down the sides to the outline. Go over these surfaces with coarse sandpaper.

Round out the fuselage as shown in the three cross-sections with a chisel. Sandpaper once more. After that, cut out the compartment on each side of fuselage to house landing gear, if landing gear is to be retractable on your model. If not, the compartment may be painted in black on the side of the fuselage during the paint "job". Make the housing for the gear 3/8 inch deep (see side view). Sandpaper the entire fuselage with fine sandpaper.

Cut out the propeller as shown in plans. Cut all the wing struts from thin strips

of wood and sandpaper them and then begin construction of the motor and cowl. Make the nine cylinders shown in front view from a piece of wood ¼ of an inch thick.

Ambroid (glue) these to a round piece of wood (also shown in front view) ½ inch thick. When connections have dried, ambroid this dummy motor in center of nose of fuselage. Paint the motor black and lay to one side while you make the cowl. The cowl may be made most easily from a fine grade of cardboard bent to shape and then held in water for about a minute. Take the cowl out of the water and lay in the sun in its circular shape to dry and it will retain its shape permanently. When it dries, ambroid around top of cylinders of dummy motor.

Make the windshield next out of scrap pieces of wood, using ambroid for connecting. Cellophane or isinglass may be used for the windows. Make the sliding enclosure next. Each line in plans of enclosure represents a panel. The enclosure is connected to the fuselage by two small panels on each side of enclosure which slide along the small strip on each side of fuselage, which should fit snugly between the panels. See side elevation.

Cut out four bombs and the large gas tank shown under fuselage between landing gear with razor blade.

The paint "job" comes next. Use dope or lacquer in order to obtain the best finish. Paint the wings, struts and tail units yellow and the fuselage silver. Give several coats in order to obtain a smooth finish.

When paint has dried, begin the assembly. Lay fuselage on flat surface with wing resting over it in correct position on small blocks at each wing tip. Connect up all wing struts that join wing with fuselage with plenty of ambroid. When connections have dried, connect the lower wing sections to fuselage with blocks under their surfaces to hold them in place. Then connect the remaining wing struts in place. The wiring will come later.

Using plenty of ambroid, join the fin and rudder piece to top of fuselage and the stabilizer pieces to the sides of fuselage.

Lay the model on its back and ambroid the landing gear in place as shown in plans. Ambroid the gas tank to bottom of fuselage and the two bombs under the surfaces of each of the lower wing sections. Whittle out a small tail skid from scrap wood and connect this to tail. Turn the model right side up and join the prop to nose, using a small straight pin as a shaft. Touch up all parts with paint and the model will be completed.

When Air Conquers Air

(Continued from page 38)

together. To do this, ¼" lengths of 1/16" O.D. aluminum tubing are used. These are glued in place on the two ¼" x ⅛" spars. The tubing may be bound in place, if desired, but plain glue has held on the original model. Be sure to match them up so that the holes coincide. When the glue has set enough to hold the tubes in place, sight through the holes on both elevators and stabilizer separately and line them up exactly. If the two sets of tubes are in proper position, the hinging effect will be perfect. The axis is, of course, a length of music wire which is pushed through from end to end. The same method is used on many large ships.

The elevators are held in position by a very simple mechanism. A piece of wire is fastened to the common spar and bent at right angles on the upper end. A piece of 1/16" square bamboo has a ⅜" length of tubing bound crosswise on one end. The tubing is slipped over the upright and bent wire and the latter turned at the end to keep the tube in place. The bamboo runs forward to the leading edge of the stabilizer, where another wire piece is bound. This wire is also bent at right angles, the horizontal portion running to the rear and being about ½" above the stabilizer surface. A rubber band wrapped around the wire and bamboo strip will allow any adjustment, but at the same time will hold the elevators firmly in place.

The rudder and fin are made in much the same manner as has been described. The fin leading edge is of ⅛" square balsa soaked and bent, while the fin rear spar is of ¼" x ⅛" balsa, tapered to ⅛" on the top. This spar is made long enough to go to the bottom of the fuselage and thus serve as a hinge support for the rudder. The wire F, on the fin, runs down through holes in the stabilizer ribs and into holes in the top fuselage longerons. It keeps the whole tail assembly in alignment. A small length of tubing is inserted in the bottom end of the fin vertical spar, which fits over wire on the bottom rear of the fuselage, holding the fin in the proper upright position. All these fittings probably sound rather confusing, but the matter can be cleared up by referring to the drawings.

The rudder hinging is made in the same way that the elevator fastening was made and the same precautions regarding lining the hinges up must be observed. Also the rudder control is made similar to the elevator control, only that the front fastening for the bamboo stick is put on the fin. A ⅜" length of tubing is fastened to the forward side of the fin leading edge right at the bottom. This slips over the flexible

wire which was put on the front of the stabilizer.

At the points shown in the drawings, lengths of heavy thread are tied to the stabilizer rear spar for bracing. Since the assembly must be entirely dismountable, the bracing has to be removable. It is made so by terminating the brace threads in pieces of small flexible wire with loop of the same on the lower part of the fuselage and on the fin rear spar. The wires may then be slipped through the loops and bent over, but are readily adjustable or removable.

The final piece of construction work is the main wing. This is made in two sections, with ¼" aluminum tubing bound to the spars on one wing and dowel sticks fastened to the other. The dowels must fit tightly and can be soaped to aid the sliding. The wing tips are of ⅛" flat balsa pieced together and well braced.

Use care in selecting the wing spars so as to have all the strength possible, for they take a considerable beating.

The ribs are all of the same section and width, with the exception of those at the inner ends, which are ¼" wide. The curve seems very thin but has plenty of lift and the ship flies quite slowly. A false or nose rib is placed between each two full ribs. The original model did not have these and the covering flattened out quite a bit, spoiling the wing curve somewhat.

The top spar is very important as it not only adds greatly to the strength of the wing, but prevents it from being warped lengthwise, as the silk covering used has a lot more pull than the ordinary Japanese tissue on small models.

The trailing edge may be of hard balsa or even spruce as strength is essential when the covering is tightened up. Otherwise, the trailing edge will present an uneven, scolloped appearance.

The wing is held to the fuselage by wire hooks bound to the main spars at the points shown. A long band of ⅛" flat rubber, each on front and back, runs under the fuselage. Thus the wing is movable and can absorb shocks.

The model is completely covered with special light silk. This is much stronger than paper and more in keeping with the model. Many model companies carry the silk in stock. It is fastened on with glue, care being taken to have the threads straight and as near right angles as possible, which will prevent uneven pull when dope is applied. The silk will probably be found much easier to apply than paper as it can be used on uneven or curved surfaces without wrinkling. It should be pulled smooth and even, but do not try to stretch it as the finish will do that.

When all covered, spray the model with plain water; this will pull it smooth and tight just as it does paper. While drying, block the wings and tail on a flat surface with weights to prevent warping. When dry, give the whole model a coat of banana oil.

The writer tried many finishes, but found Duco paint the best. One coat over the banana oil is plenty and the covering stays perfectly tight. The original model is orange and white with black trimming.

The propeller on this model is a 14" balsa one, designed for this motor with a 16" pitch.

When flying it is best to start R.O.G. and with 80 pounds or so air pressure. Do not push the model, just let it roll. The large tail surfaces are very sensitive and afford absolute control. When the model has been well tried out and adjusted, give it the full pressure and let it ride. For best results, the motor should be lubricated with special oil before every flight.

Air Ways

(Continued from page 19)

Here is an unusual picture, No. 8. It is a flight of S-E-5s bearing down upon the camera man. No, is is not a picture taken during the World War at the front, but merely a photograph of model ships built by Duncan C. Morrison of Abingdon, Illinois. Believe it or not, these ships are strung on wire! Through the use of model airplanes, trick photography seems to be developing rapidly and to a high degree of efficiency. This is one of the best "shots" we have seen of models. The planes have a wing spread of four and three-quarter inches and detailed to the extent of dummy Hispano motors, exhaust stacks and pipes made from one-sixteenth inch doweling, notched radiators, fixed Vickers gun mounted on the cowl, movable Lewis gun on the upper wings, as well as the insignia in color. The ships are painted white with black details.

A portrait attachment was used in the camera in order to obtain the proper focus. The planes were suspended from a wooden "V" frame by thread. This gives the realistic "V" formation. Morrison says he had the pleasure of fooling a transport pilot with this picture, who refused to believe that it was faked!

Gas jobs are taking various forms these days. Not satisfied with building a monoplane, Leonard Phillips of 1260 Cameron Avenue, Salt Lake City, Utah, is building a biplane. He is shown with it in picture No. 9. In order to show the unusual size of the gas job, Phillips has placed a small scale model beside it. The gas job is a Boeing 95 Mail Plane, with a wing span of eighty-three and one-half inches. It weighs approximately six pounds. A Brown Junior engine provides the power. Phillips says he has not test-flown it yet; however, from its general appearance we would say that its flights will be successful. It is a good looking job.

One might easily make the mistake of assuming that picture No. 10 was taken at an airport during the World War. However, it is only three scale models of a Spad, Albatros D-3 and a Nieuport 17C-1. They were built by Pel Burnett, Thracy Petrides of 719 West 180th Street, New York City, and Manfred E. Huffman of 622 West 179th Street, New York City, respectively.

MODEL NEWS FROM OTHER COUNTRIES

Australia

From New South Wales, Australia, through the courtesy of Mr. Ivor Freshman, we have received picture No. 11, which shows a flying scale model of a Comper Swift, built by Russell Jackson. The unique part of this ship is the shock absorber system, which is just like the big ship. This plane made a flight of forty-two seconds.

Scotland

A gas job of unusual design is shown in picture No. 12. It is of the low-wing type and was built by C. E. Bowden of 33 Randolph Road, Glasgow, W. 1, Scotland, Captain, R.A.F.C. It weighs seven pounds and has an eight foot wing span. The high camber wing was used in order to obtain a slow flight. Captain Bowden, up to the time of going to press, holds the gas model plane record in England with a flight of eight minutes, forty-two seconds. The ship actually flew fifteen minutes, but it was not timed after it flew out of sight. This was due to the fact that there is a rule in England that the official time keepers must remain at the place from which the models start on their flight. It appears, under these conditions, that such a flight is not a duration record contest but rather a test of the eyesight of the time keepers. The model holding the British record will be shown in our next issue.

France

We again have news from France. Mr. Pierre Legros of 47 Rue des Tournelles, Paris-3, France, writes us that interest is growing rapidly in model flying in his country. Mr. Legros is secretary of the most active group there. Its name is the Escadre de La Rose des Vents.

Picture No. 13 shows a member of this club, M. Varache, with one of his ships. It is a fuselage model with a wing span of one meter, twenty centimeters. We are in doubt as to some of the data provided with this model, as it was given in French. However, as far as we can determine, the translation is that this model flew for five minutes, fifty-nine seconds, crossing the Seine River during its flight.

CLUB NEWS

Milwaukee "Helldivers"

Milwaukee has always been very air-minded, though from a letter received lately from Harold G. Sinsky, 2123 North Farwell Avenue, Milwaukee, Wisconsin, it would seem that the various model clubs are unorganized in this city. For the good of model flying and the dissemination of model information, we hope that these clubs can get together. Much more can be done as a unit than as individual groups, working independently.

Picture No. 14 shows the group Mr. Sinsky is associated with, called the "Helldivers", which is for young men and women over twenty-one years of age who are going in for the study of aerodynamics through the medium of model flying. Here are some very wise aviation enthusiasts. Many of our aviation men scorn to touch a model plane because they feel they are toys. This is true, unquestionably, to a lack of knowledge on their part regarding the information that may be obtained from the study of these miniature ships. If you play with them they are toys, to be sure, but they may be used as a medium for

study which will show many important points regarding stability, which are at present foreign to the minds of airplane designers. As proof of this, note the present type of airplane in every day use, which is efficient but usually most unstable. These airplanes could be made stable and safe with a little modification in design, prompted by model experience.

Columbus, Ohio, Model Club

Picture No. 16 shows John Malloy of 101 West Webster Park Avenue, Columbus, Ohio, who won the Ohio State Championship recently. The Monocoupe which he holds won second place in the Outdoor Senior Flying Scale Model Event of the Ohio State Championships, held recently at Columbus, Ohio. The plane made a duration flight of sixty-three seconds.

Bamberger Aero Club

News comes from Mr. Nathan Polk, director of the Bamberger Aero Club, as we go to press, that the Club will hold a Gas Engine Model Contest on September 29, 1934. By the time you read this item this date will have passed and fate will have determined the winners. Whose names will appear in our next issue?

It is interesting to note that the members of this club took six out of the eighteen prizes at the New York City State Derby which was held on the Sheep Meadow in Central Park on July 18th. The members who placed were Paul Kaighen, George Brown, Frank Ehling, Henry Hahner, and Annabal Ferrera. The Club had the largest attendance of all clubs represented at the meet, thirty in all.

On September 8th a notable array of model enthusiasts assembled at the Bamberger Aero Club headquarters for the Second Annual Model Airplane Convention. This was held for the purpose of discussion. Suggestions for changes in rules were presented to the National Aeronautic Association. Talks on many phases of model aviation were given by many prominent builders, including Gordon Light, Joseph Kovel, Mr. Victor Fritz of Philadelphia and others.

Jimmie Allen Air Races

The Jimmie Allen Air Races have attracted a great deal of attention all over the country. Recently contests were held at Tulsa, Kansas City, Des Moines, St. Louis, Peoria, Cedar Rapids, Minneapolis, Dubuque, Wichita, Denver and Omaha. Records of every kind were broken in these races, the last of which was held at Omaha, July 15th, at the Omaha Municipal Airport.

The first of the new records was made by Richard Funk, a messenger boy of Kansas City. Richard launched his plane, then had to rush off to work and didn't know until it was all over what a record his ship had made. The plane stayed aloft eight minutes, twenty-one and two-fifth seconds, for a new time record. It attained an altitude of more than two thousand feet and flew more than five miles. All this happened in just about the time it takes to tell it in Kansas City on July 1st.

The next week, Lee Schubert of St. Louis launched his plane at the Parks Airport in East St. Louis, Ill. The flight of his ship was nearly as long as Funk's, but failed to equal Funk's flight by a little short of a minute. However, it flew clear across the Mississippi River and landed in a back yard in St. Louis, having covered seven miles of ground. Attendance records were broken in all cities where the Jimmie Allen Air Races were held. We would say that these boys are doing fine work—more power to them.

American Air Photo Exchange.

Mr. Reid Patterson, Secretary of the American Air Photo Exchange, writes to tell us that he wishes to increase the membership of his organization. The requirements are that each member have negatives size 116 of at least twenty-five different planes. Will all that can fill these requirements, please write for information concerning the Exchange to Mr. Reid Patterson, 325 East 7th Street, Charlotte, North Carolina?

Atlanta Model Airplane Club

Picture No. 16 shows the active Atlanta Model Airplane Club, with headquarters at 64 Broad Street Northwest, Atlanta, Ga.

The membership of the Atlanta Model Airplane Club of 64 Broad Street, N.W., Atlanta, Georgia, has increased from approximately thirty members to a present total of over one hundred. Aided by their sponsor, Mrs. Minna M. Hamilton, their number of activities have increased as well. Following is a list of the club's records:

Indoor

Event	*Time*	*Holder*
Baby R.O.G.	3:08	Jim Lovett
Endurance	4:00	Jim Lovett
Flying Fuselage	:50	Jack Burton

In the non-flying scale event, Jack Coppage won with a beautifully built Gee

Bee. The picture of this plane appeared in the August issue of UNIVERSAL MODEL AIRPLANE NEWS.

Outdoor

Event	*Time*	*Holder*
Flying Scale	1:34	Frampton Ellis
Flying Fuselage	3:30	Bill Paxton
Baby R.O.G.	2:10	Carver Brothers
Single Stick	3:30	Frampton Ellis
Twin Stick	2:43	Carl Buck
Free for All	4:30	Frampton Ellis

The model belonging to Bill Paxton, a Gordon Light model, flew unofficially for five minutes, when it disappeared from sight. Some time ago, Frampton Ellis' single tractor flew nine minutes, in sight.

Official Club contests are held every three months. A record of each winner is kept by the secretary and at the end of the first fiscal year, two trophies are to be awarded to the two members having the greatest number of accumulated points.

CORRESPONDENTS

The following readers would greatly appreciate receiving correspondence from other readers and clubs. They promise to answer all letters.

Falcon Aero Club, 1117 New York Avenue, Brooklyn, New York.

Roger Perrault, Lyndonville, Vermont.

Gene Niece, 123 East Main, Okmulgee, Oklahoma.

Roy Rogers, 595 Carling Avenue, Macon, Georgia.

David Van Westen, 7303 Otis Street, Bell, California.

Aviation Advisory Board

(Continued from page 30)

ticular degree of lateral stability is to be obtained. The taper on a wing tends to give a slight stabilizing effect if the leading edges are swept back; in effect, this is a swept-back wing. When dihedral angle is used, efficiency is lost to a certain degree. Thus, gliders do not employ it, as efficiency is the first consideration in their case. We are glad to see that some transports are using it, which indicates that greater thought is given to stability.

H. Bodger of 3956 Ingraham Street, Los Angeles, Cal., wishes to know:

Question: Where can I buy airplane silk which is not too costly?

Answer: Many model supply houses provide this commodity. It may also be purchased in department stores. A good grade of China silk is advisable.

V. V. Hannah of 2180 South Acoma Street, Denver, Colorado, wishes to know the answer to the following questions:

Question: How do you determine the center of lift on a biplane like the "Hell Diver"?

Answer: The point at which the center of lift acts, moves forward and backward with any change in the angle of attack of the wing or wings. However, for normal flight position the center of lift may be determined as being at a point which is three-fifths the distance between the lower and upper wings, upward from the bottom wing on a line joining points on each wing, which are one-third of the chord length back of the leading edge of the wing; and on the upper surface of the airfoil.

This is a rather involved explanation. It may be more readily understood if you draw a simple sketch of the biplane arrangement and lay out graphically the description given here.

BACK ISSUES WANTED

July 1929

January 1930

January 1931

We are desirous of obtaining the above three issues of Model Airplane News to complete our files. We will pay our readers 20c each for these magazines provided no pages are missing or torn, covers are clean, not being glued or pasted together in any manner and provided the general appearance of the magazines denote good condition.

If the issues you have on hand do not come up to our requirements please do not send them to us.

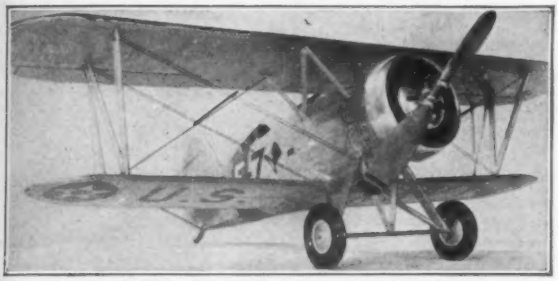
Send your copies to the **Periodical Dept., Jay Publishing Corp., 551 Fifth Avenue, New York City.**

NEW LOCKHEED P23 ARMY PURSUIT

Combination Land and Sea Plane Set
32" Span. Length, 22½". Weight 3¼ oz.

One of the most outstanding values in models; it has excellent lifting power, rising from land or water in a few feet. From the latest army land plane it is convertible into Lindbergh's seaplane by attaching the floats, material for which is in the set. Construction set contains: formers, ribs and pontoon parts printed on balsa, turned cowl, front celluloid wheels, axles, colored insignias, U. S. Army lettering, semi-scale propeller, yellow and drab dope, glue, 33"x44" full scale drawing, etc. Construction Set Complete, postpaid.... **$2.75**

BOEING F4 B4 NAVY PURSUIT



22½" Span. Weight 2½ oz. Flies 750 Feet

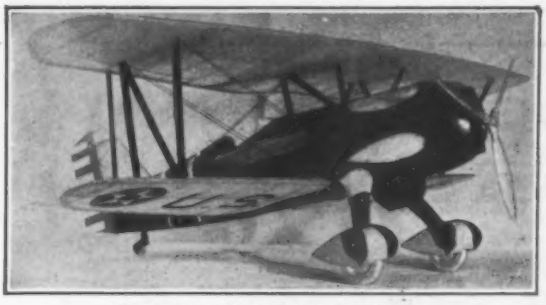
A special detailed model of Boeing's latest pursuit. Construction Set includes fuselage formers, ribs printed on balsa, wing, fuselage and Navy insignia, printed instrument board, celluloid wheels with silver discs, silver and yellow dope, glue, drawing, 3" celluloid motor, aluminum motor plate and drag ring, tail wheel, flying wires, ready formed wire parts. This model is not only an excellent flyer but a beautiful show piece. Construction Set comes in colored label gift box. Postpaid..... **$2.95**

NORTHROP GAMMA

36" Span. Weight 3½ oz. Color, Silver, etc.

This is a special DeLuxe model of the Texaco Gamma flown by Capt. Hawks; also used as the T. W. A. mail speed plane and U. S. Army attack plane, which has broken many speed records. Set includes 9 cylinder celluloid motor, aluminum motor plate, a special 3¼" tapered streamline aluminum cowl, celluloid wheels, axles, rubber motor, tail wheel, 3 colored dopes, glue, formed wire parts, lettering and insignias, detail drawings, all parts printed on balsa. Construction Set Complete, postpaid..... **$3.75**

CURTISS ARMY HAWK P6E PURSUIT



24" Span. Weight 2½ oz. Flies 800 Feet

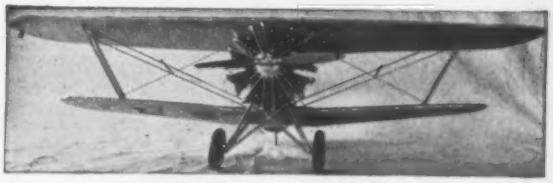
This new improved model of the P6E is the strongest and most perfect to be had; it is practically crash proof. Set includes: ribs, fuselage formers, radiator, wing tips, wheelpants, printed on balsa. Strong aluminum wheels, tail wheel, hollow metal exhaust pipes, wing, rudder, fuselage and U. S. Army insignias, printed instrument board, turned nose plug, formed prop shaft and motor hook, semi-scale fibre propeller, yellow and drab dope, glue, detail drawing with squadron design for fuselage and wheelpants. Set comes in colored labeled gift box sealed.
Construction Set complete, postpaid **$2.50**

CURTISS NAVY SEA HAWK P3A

24" Span. Weight 2¼ oz. Flies 900 Feet. Color, Silver

New redesigned model with all parts printed on balsa. A finely detailed model, practically crashproof. Set includes: 3" celluloid motor, aluminum motor plate and drag ring, balloon celluloid wheels, printed instrument board, fuselage, wing and rudder insignia, pilot's seat, aluminum drawing, semi-scale fibre prop, scale aluminum machine gun, dope, glue. Set in colored labeled gift box.
Set Complete, postpaid **$2.50**

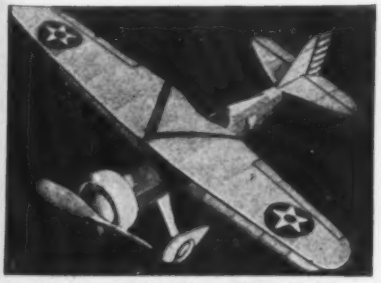
CURTISS CYCLONE SEA HAWK P3A



24" Span. Weight 2½ oz. Flies 900 Feet

A full front view of the model shown above. One of the most exclusive models on the market, equipped with 3¾" celluloid Cyclone 700 H.P. motor, without cowl.
Construction Set Complete, postpaid **$2.95**

Curtiss Goshawk



12" Span. Weight ¾ oz. Flying Model

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24" Span. Weight 2½ oz. Flies 650 Feet

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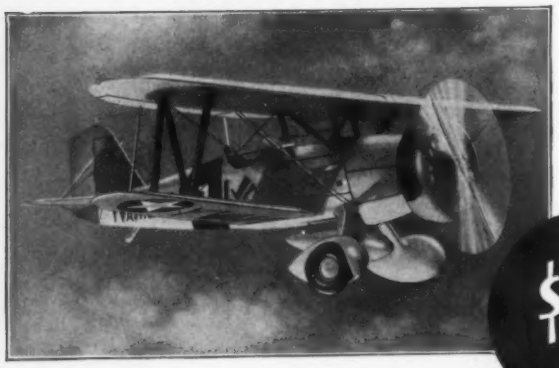

The CURTISS GOSHAWK

WOW! What a model! What a kit! What a value! Boy, you'll rave about Comet's great new Curtiss Goshawk—a faithful scale model of Uncle Sam's most talked-of ship! 360 miles per hour in a power dive—that's speed! Machine guns trained to spit their deadly hail from between the cylinders of the motor. Shock absorbing landing gear—dozens of other features. Kit contains many Balsa stringers, wing spars, formers and ribs clearly printed on high grade Balsa veneer, tissue, cement, banana liquid, rubber motor, semi-shaped wheel pants, wheels, metal fittings and washers, colorful naval insignia, semi-shaped cowling, printed scale propeller, auxiliary gas tank, carved Balsa propeller, tubed aluminum gunsight, strut Balsa, rubber cockpit coaming, plenty of sheet Balsa, thread, dope brush, printed rib sheet, sand paper, and everything else you need. New type fuselage saves 4 hours' work. What a seller this great kit will be at only $1.00 postpaid.

$1 Postpaid

WINGSPAN — 19½ Inches

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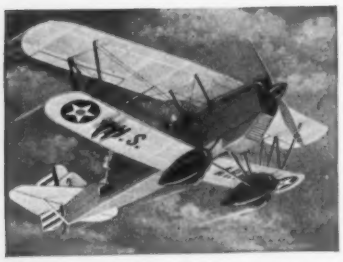

THE NEW CURTISS FALCON
24" wingspan .....Postpaid **$1.95**

THE NEW CURTISS-SWIFT
Wingspan—15" ..... Postpaid **75c**

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CURTISS ROBIN - 50c

Wingspan 17½"

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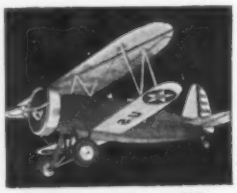
CURTISS HAWK
11½" wingspan **35c**
Postpaid



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OTHER 50c MODELS

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C-1 Pursuit—15" wingspan

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